Mathbook PC 12 Homework

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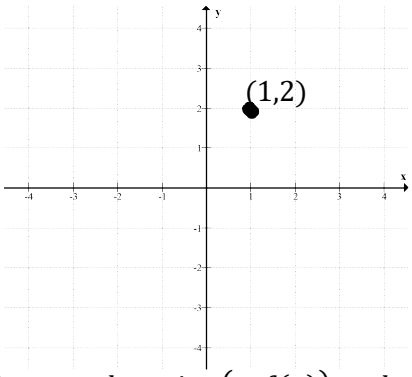
C12 - 1.1 - VHT Points HW



Point

$(x, f(x)) = (1,2)$

Perform the following operations on the point $(x, f(x))$ *and state the new point and write in mapping notation. Draw the new point on the graph.*

$y = f(x) + 1$

$y = f(x) - 3$

$g(x) - 2 = f(x)$

A vertical translation up 2

$g(x) = f(x - 3)$

$m(x) = f(x + 2)$

A horizontal translation right 1

$y = f(x - 1) + 1$

$y + 4 = f(x + 2)$

$y + 7 = f(x + 5)$

A vertical translation up 1 and
A horizontal translation left 5

Notice!

A horizontal translation left 5 and
A vertical translation up 1

C12 - 1.1 - VHT Function Notation f(x) HW

$Solve$

$$\boxed{f(x) = x^2}$$

$f(2) =$

$f(-3) - 1 =$

Find the new equation of $@(x)$; a transformation of $f(x)$ above. State the Transformation/s.

$g(x) = f(x - 2)$

$h(x) = f(x + 1)$

A horizontal translation left 4

$p(x) = f(x) + 1$

$k(x) + 3 = f(x)$

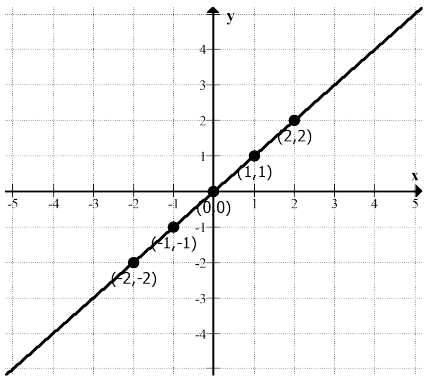
A vertical translation up 2

$w(x) = f(x + 2) - 4$

$n(x) - 2 = f(x + 4)$

A vertical translation up 1 and
A horizontal translation left 5

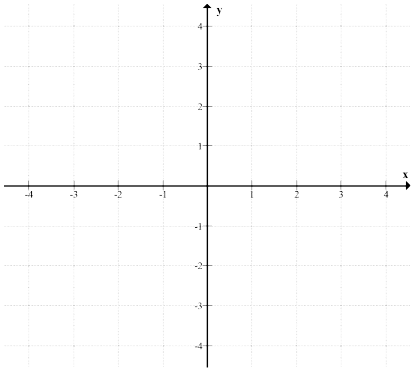
C12 - 1.1 - VHT Graphs y= HW



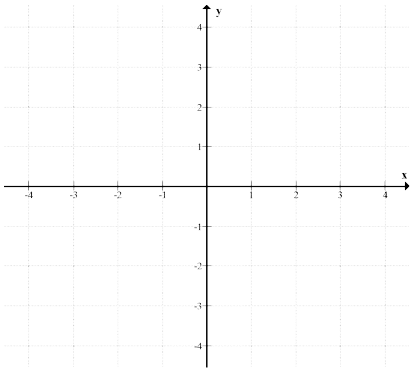
$y = f(x)$

Perform the following operations on the graph $f(x)$ and draw the new graph.

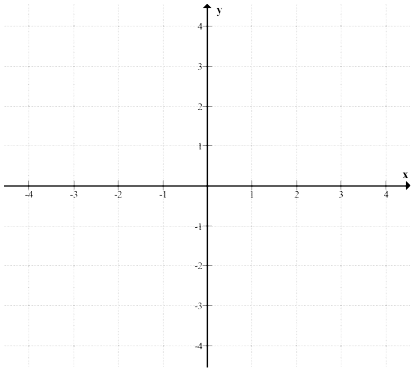
$y = f(x) + 1$

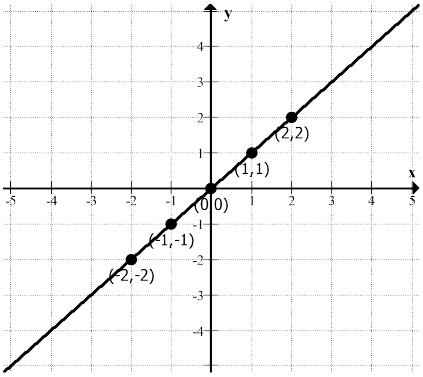


$y = f(x + 2)$



$y = f(x - 1) + 3$

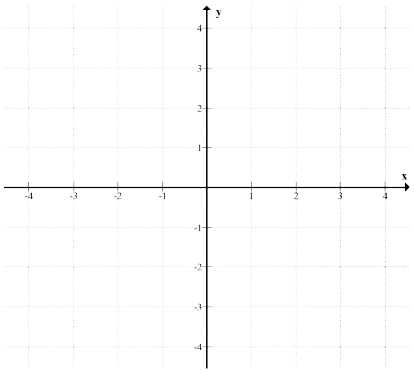




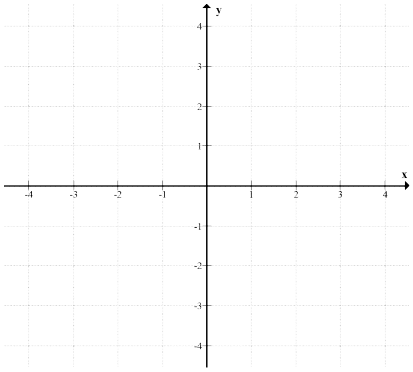
$y = x$

Perform the following operations on the equation and graph $y = x$ and draw the new graph.

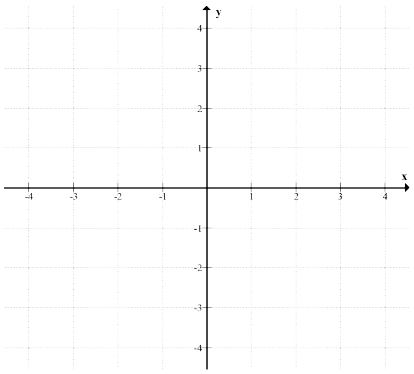
$y = x$ $VT + 1$



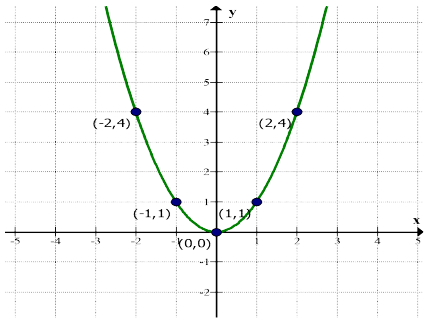
$y = x$ $HT = -2$



$y = x$ $HT = +1$ $VT = +3$



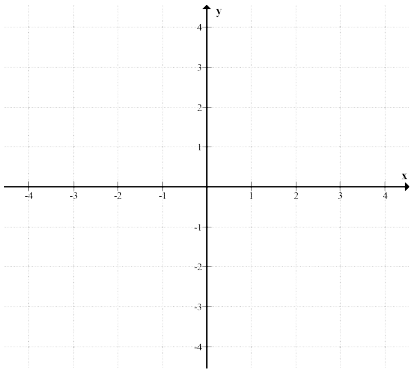
C12 - 1.1 - VHT Graphs y= HW



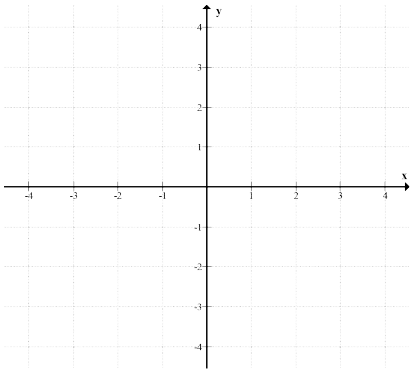
$y = g(x)$

Perform the following operations on the graph $g(x)$ and draw the new graph.

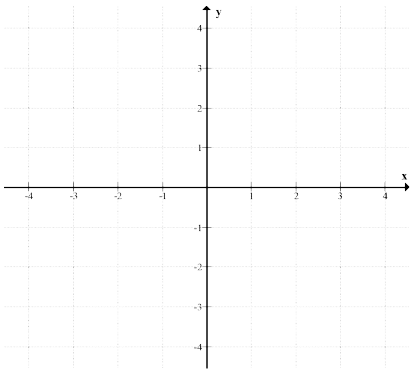
$y - 1 = g(x)$

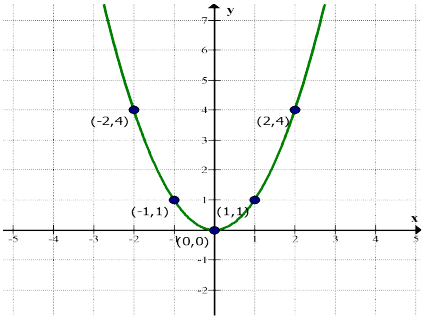


$y = g(x + 2)$



$y + 3 = g(x - 1)$

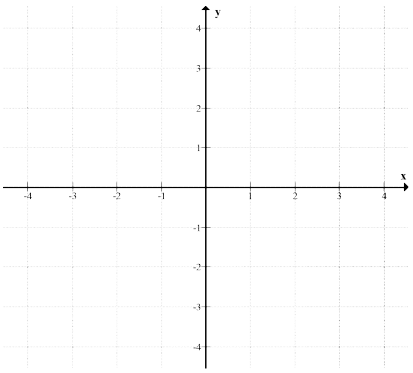




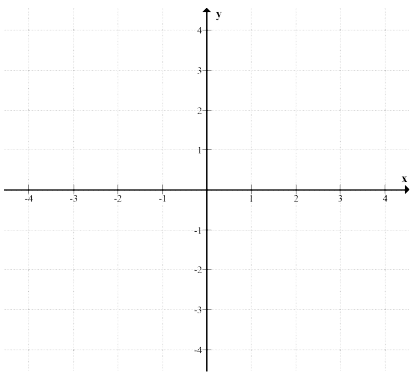
$y = x^2$

Perform the following operations on the equation $y = x^2$ and draw the new graph.

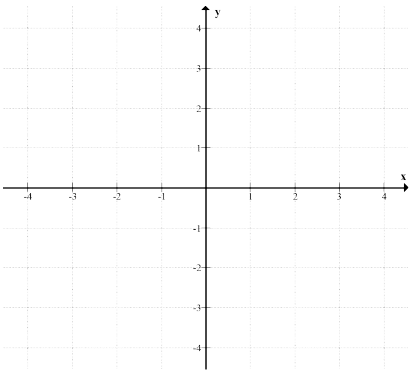
$y = x^2$ $VT + 1$



$y = x^2$ $HT = -2$

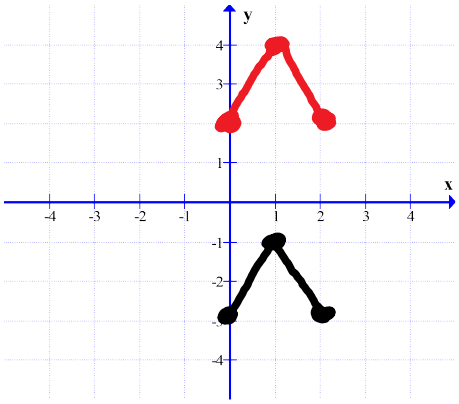


$y = x^2$ $HT = +1$ $VT = +3$



C12 - 1.1 - VHT Graph f(x) HW

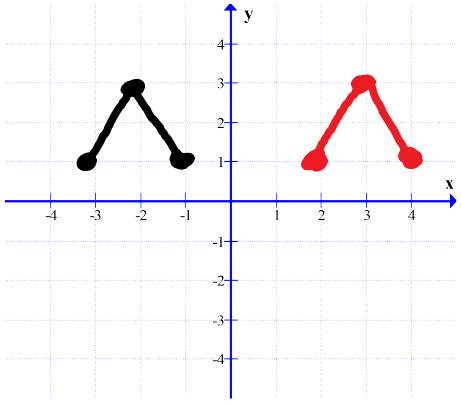
Find the transformed equation of $f(x)$ in all forms.



$y = f(x)$

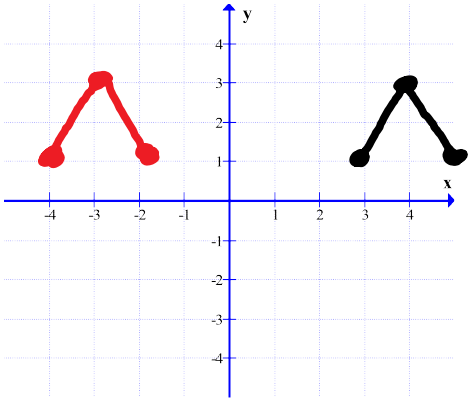
$y = f(x) + k$

$y - k = f(x)$



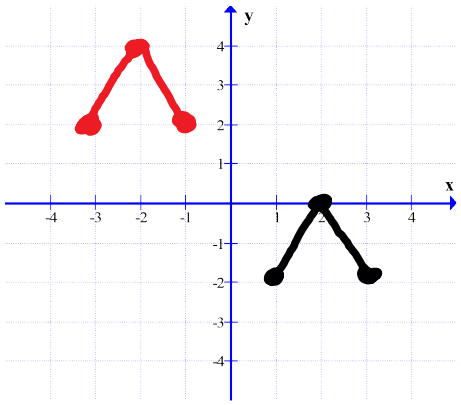
$y = f(x)$

$y = f(x - h)$



$y = f(x - h)$

$y = f(x)$

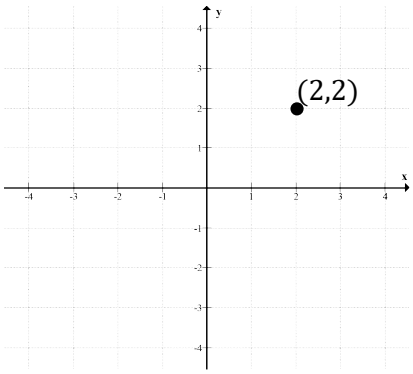


$y = f(x)$

$y = f(x - h) + k$

$y - k = f(x - h)$

C12 - 1.2 - VHCER Point HW



Point

$(x, f(x)) = (2,2)$

Perform the following operations on the point $(x, f(x))$ *and state the new point and write in mapping notation. Draw the new point on the graph.*

$y = 2f(x)$ $y = \frac{1}{2}f(x)$ $2y = f(x)$ $\frac{1}{3}y = f(x)$ $y = \frac{2}{3}f(x)$

$y = f(2x)$ $y = f\left(\frac{1}{2}x\right)$ $y = f(3x)$ A vertical expansion by a factor of 2 A horizontal compression by a factor of $\frac{1}{2}$

$y = 2f(2x)$ $y = \frac{3}{2}f(2x)$ $\frac{1}{3}y = f\left(\frac{2}{3}x\right)$ $5y = f\left(\frac{1}{3}x\right)$ $y = 2f(5x)$

$y = f(-x)$ A vertical reflection $-y = f(x)$ $y = -f(-x)$

C12 - 1.2 - VHCER Function Notation f(x) HW

$Solve$

$f(-5) =$

$\boxed{f(x) = x^2}$

$2f(5) =$

Find the new equation of @(x); a transformation of f(x). State the Transformation/s.

$k(x) = f(2x)$

$k(x) = f(\frac{1}{2}x)$

A horizontal compression by a factor of $\frac{1}{2}$

$k(x) = 2f(x)$

$m(x) = \frac{1}{2}f(x)$

A vertical expansion by a factor of 2

$2(x) = f(x)$

$k(x) = f(\frac{3}{2}x)$

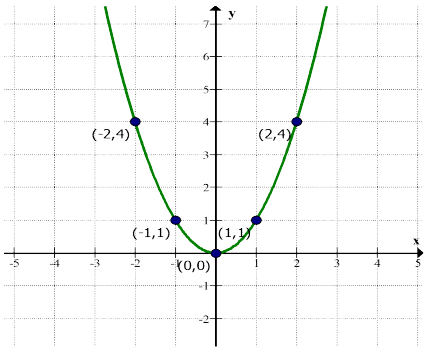
A horizontal expansion by a factor of 2

A vertical compression by a factor of $\frac{1}{2}$

A vertical reflection

$h(x) = -f(x)$

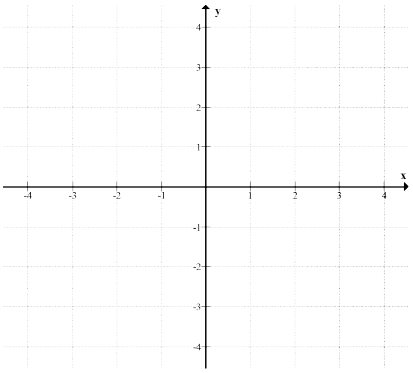
C12 - 1.2 - VHCER Graphs y= HW



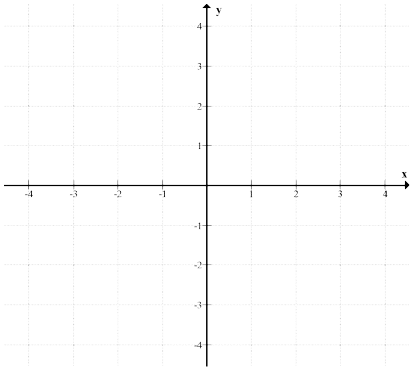
$y = g(x)$

Perform the following operations on the graph $g(x)$ and draw the new graph.

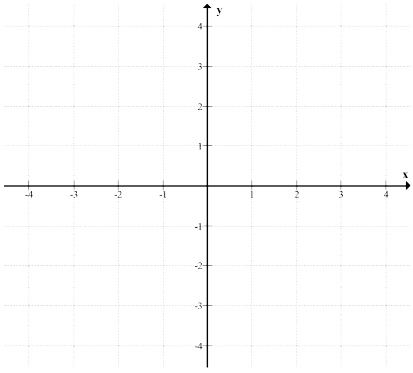
$y = g(2x)$

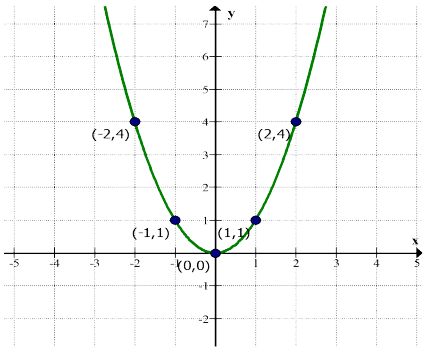


$y = -2g(x)$



$y = g(-x)$

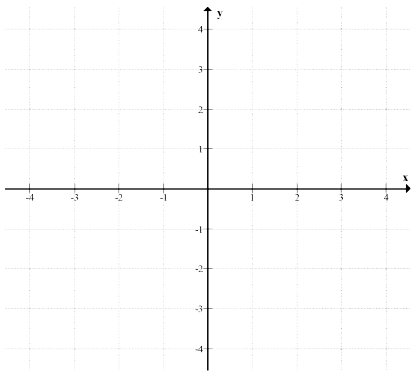




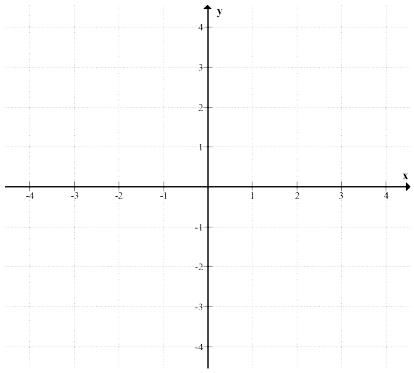
$y = x^2$

Perform the following operations on the equation $y = x^2$ and draw the new graph.

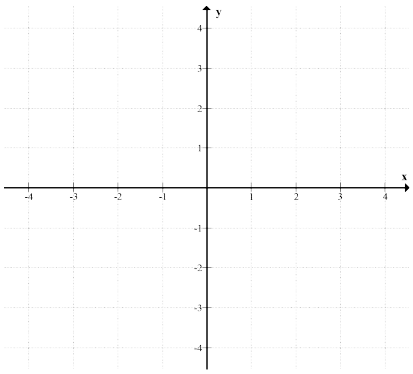
$\frac{1}{2}y = x^2$



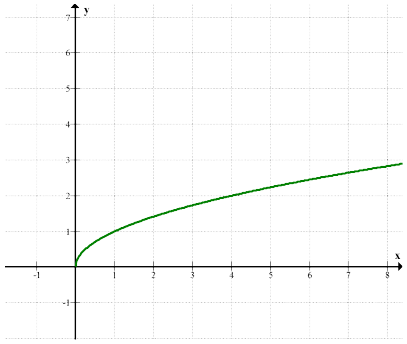
$-y = x^2$



$y = (-x)^2$



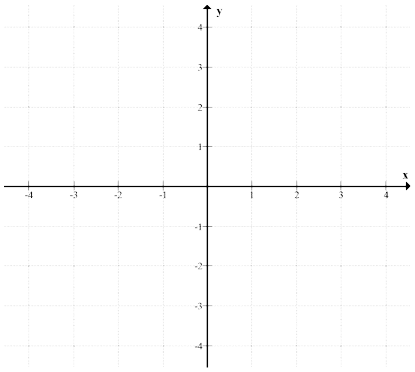
C12 - 1.2 - VHCER Graphs y= HW



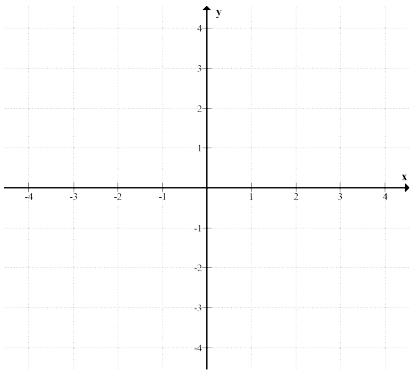
$y = f(x)$

Perform the following operations on the graph $f(x)$ and draw the new graph.

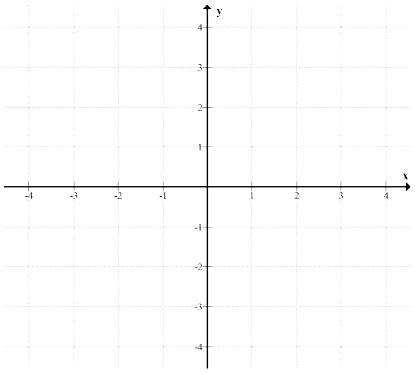
$y = 2f(x)$

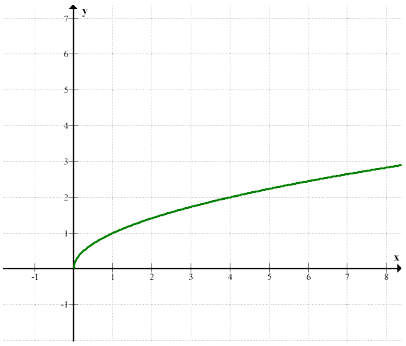


$y = f(2x)$



$\frac{1}{2}y = -f(x)$

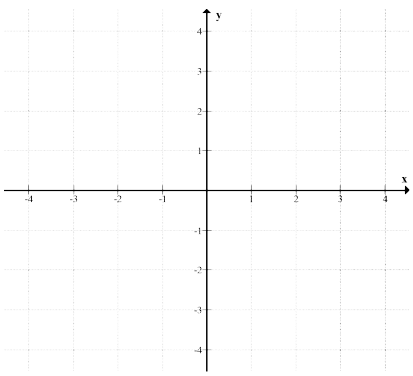




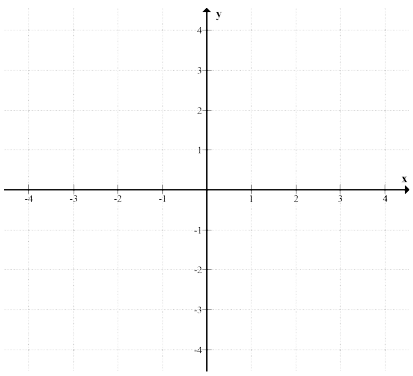
$y = \sqrt{x}$

Perform the following operations on the equation $y = \sqrt{x}$ and draw the new graph.

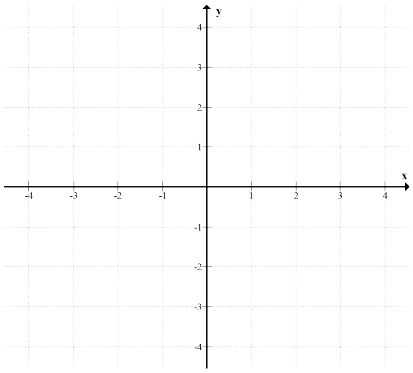
$y = 2f(x)$



$y = f(2x)$

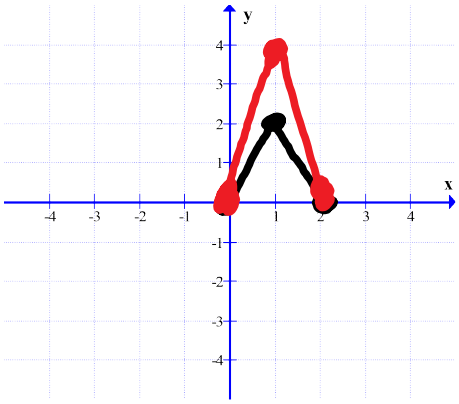


$-y = f(x)$



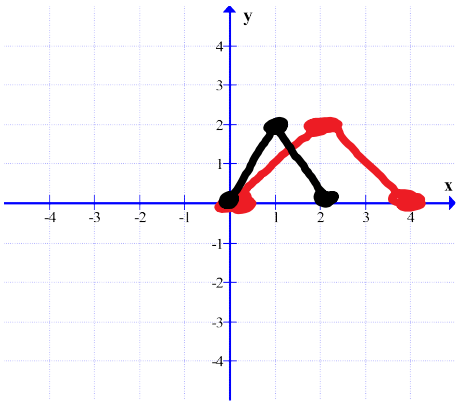
C12 - 1.2 - VHCE Graph f(x) HW

Find the transformed equation of $f(x)$ in all forms.

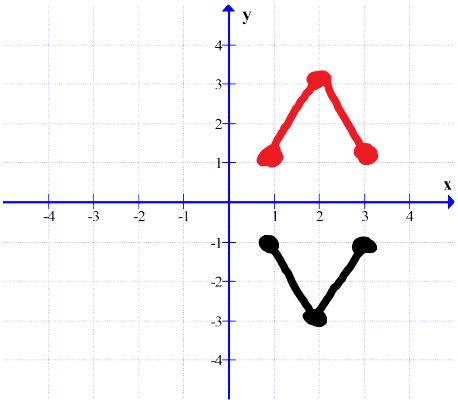


$y = f(x)$

$y = af(x)$ $ay = f(x)$



$y = f(bx)$ $y = f(x)$

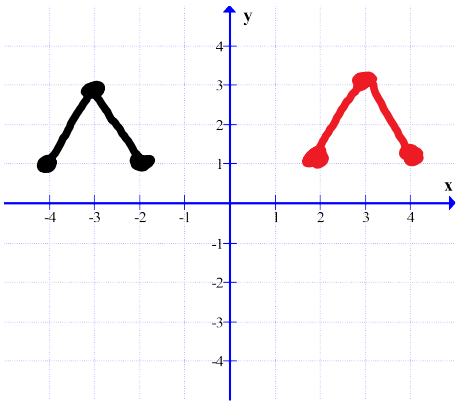


$y = f(x)$

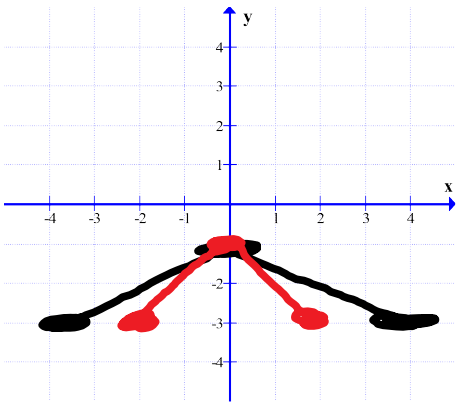
$y = af(x)$ $ay = f(x)$

C12 - 1.2 - VHCE Graph f(x) HW

Find the transformed equation of $f(x)$ in all forms.

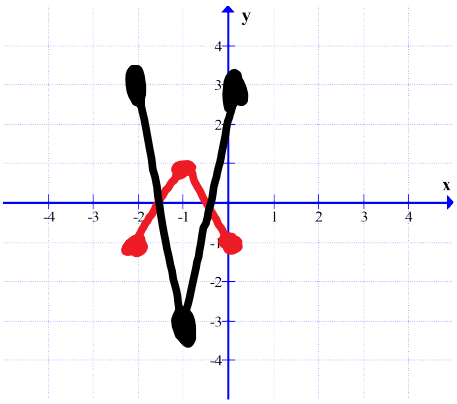


$y = f(bx)$ $y = f(x)$



$y = f(bx)$

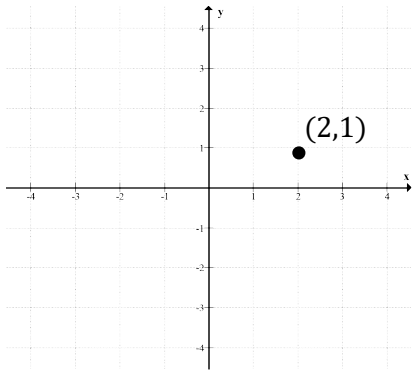
$y = f(x)$



$y = f(x)$

$y = af(x)$ $ay = f(x)$

C12 - 1.3 - VHTCER Point/s/Algebra/Factor/Order HW



Point

$(x, f(x)) = (2,1)$

Perform the following operations on the point $(x, f(x))$ *and state the new point and write in mapping notation. Draw the new point on the graph.*

$y = 2f(x) + 1$ $y - 1 = -f(x)$ $2y + 6 = f(x)$ $y = f(2(x + 3))$

$y = f(-(x + 1))$ $y = f(2x + 4)$ $y + 2 = f(2x)$ $\frac{1}{2}y = f(2x) - 2$

$y = f^{-1}(x) + 1$ $y = f^{-1}\left(\frac{1}{2}x\right)$ $y = |f^{-1}(x - 2)|$

$\frac{1}{3}y = f(2(x + 1)) - 2$ $-\frac{1}{2}y = f(2(x - 1)) - 2$ $y = -2f(-2x + 4)) - 2$

C12 - 1.3 - VHTCER Function Notation f(x) HW

Solve

$$\boxed{f(x) = x^2}$$

$f(-4) =$

$f(2) + 1 =$

Find the new equation of @(x); a transformation of f(x).

$k(x) = -2f(x) - 3$

$\frac{1}{2}g(x) + 1 = f(x)$

$p(x) = f(-3x - 6)$

$h(x) = f(2(x - 2))$

$\frac{1}{2}(q(x) + 4) = f(-2x + 2))$

C12 - 1.3 - VHTCER y= HW

Find the new equation.

$y = x^2 + x$

A Horizontal Reflection
A vertical expansion by a factor of 2
A vertical translation up 1
A horizontal translation left 5

$y = 4x^3 - 2x$

A Vertical Reflection
A vertical compression by a factor of $\frac{1}{2}$
A vertical translation up 1
A horizontal translation left 5

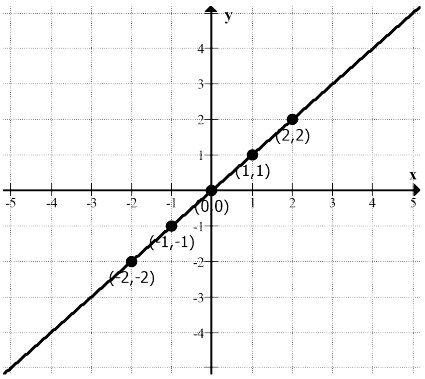
$y = \sqrt{x}$

A horizontal expansion by a factor of 2 and
A Horizontal reflection
A vertical translation up 1
A horizontal translation right 5

$y = |x|$

A horizontal compression by a factor of $\frac{1}{2}$ and
A vertical reflection
A vertical translation down 3
A horizontal translation left 3

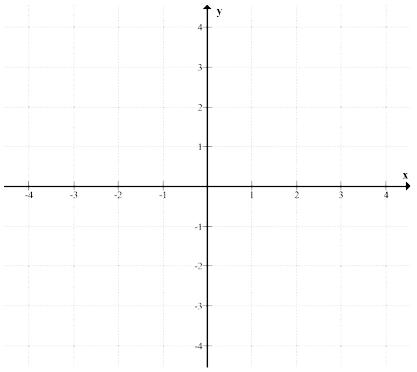
C12 - 1.3 - VHTCER Graphs y= HW



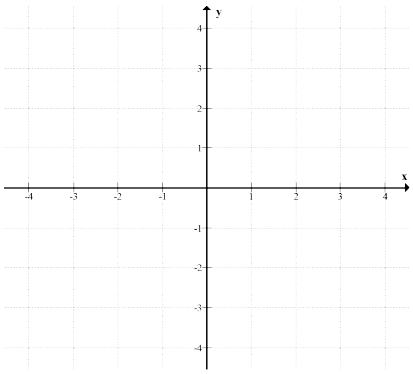
$y = f(x)$

Perform the following operations on the graph $f(x)$ and draw the new graph.

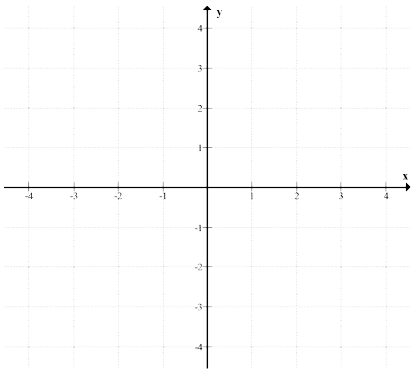
$y - 1 = 2f(x)$



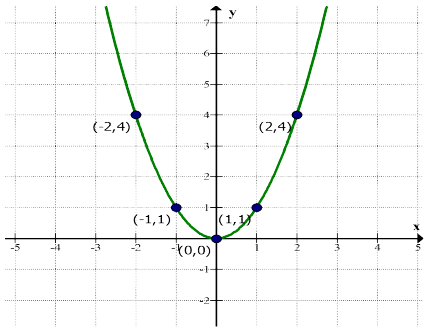
$y = f(-(x + 2))$



$2y = g(2x)$

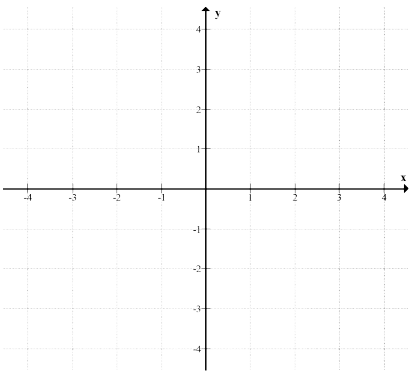


Perform the following operations on the graph $g(x)$ and draw the new graph.

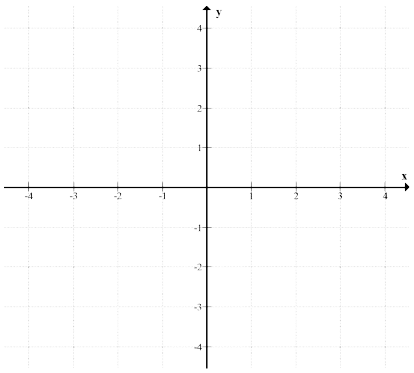


$y = x^2$

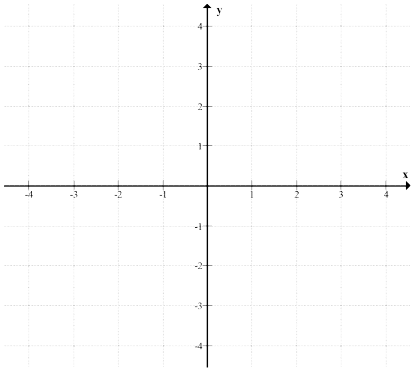
$2y = x^2 + 6$



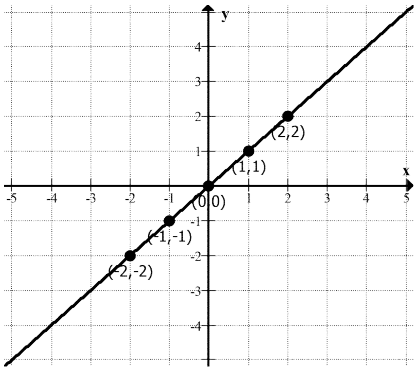
$y = (2x + 2)^2$



$-y = g(x)$



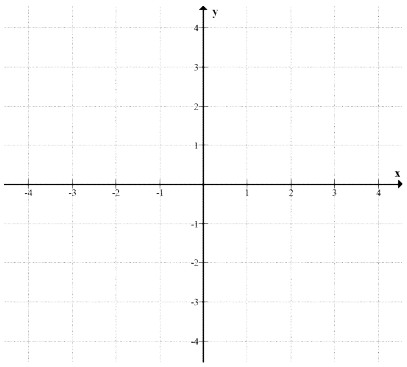
C12 - 1.3 - VHTCER Graphs y= HW



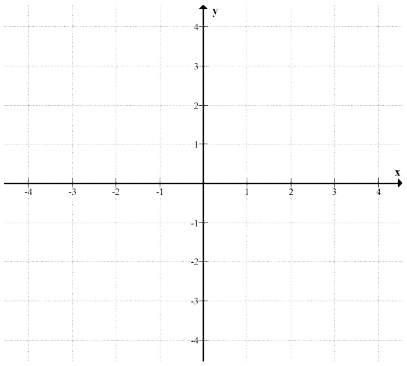
$y = f(x)$

Perform the following operations on the graph $f(x)$ and draw the new graph.

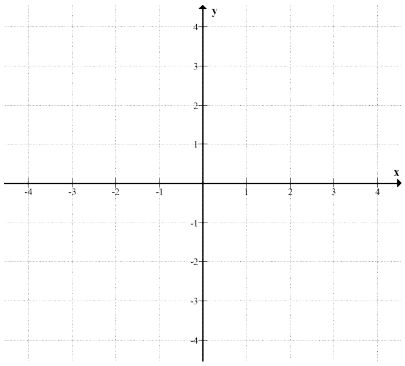
$\frac{1}{2}y = f(x) + 1$

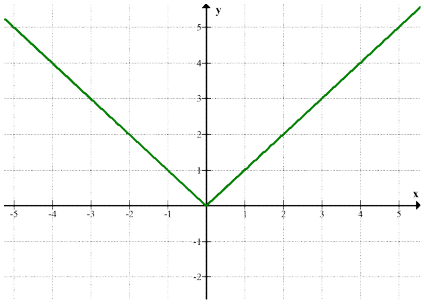


$y = f(-(x+2))$



$2y = g(2x)$

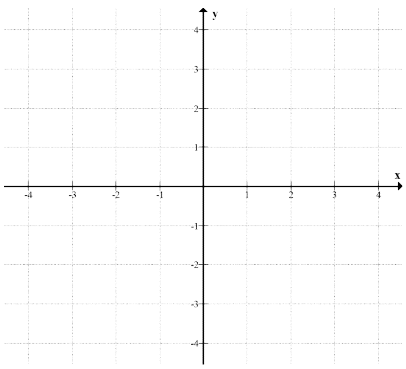




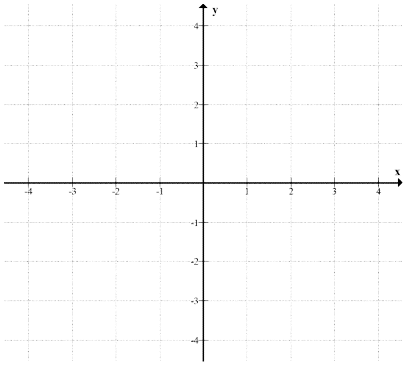
$y = |x|$

Perform the following operations on the graph $g(x)$ and draw the new graph.

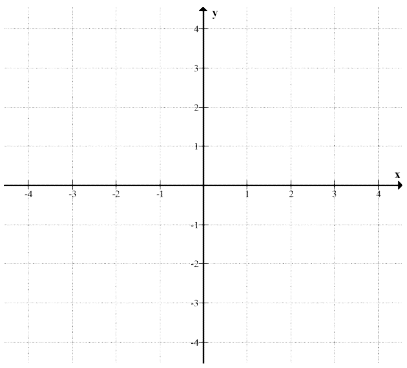
$2y = |x| + 4$



$y = |2x + 4|$

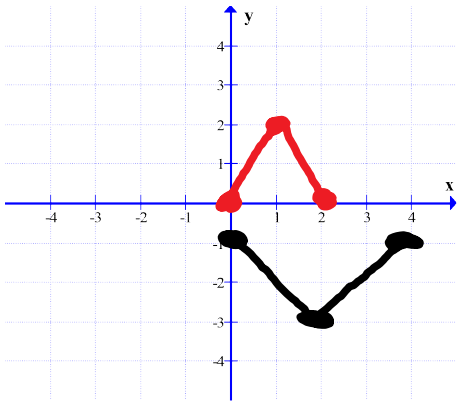


$-y = |x|$



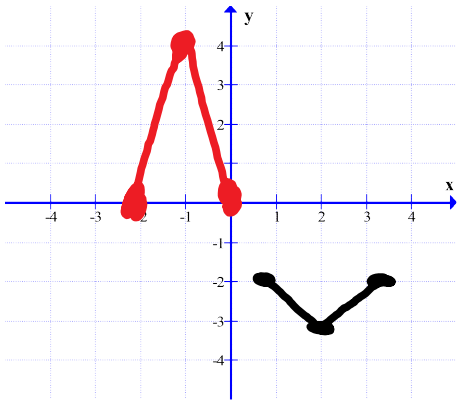
C12 - 1.3 - VHTCER Graph f(x) HW

Find the transformed equation. Multiple Solutions



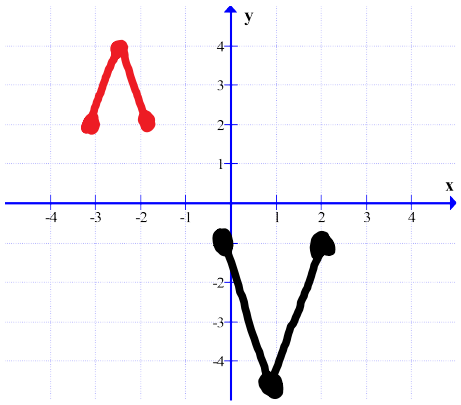
$y = f(x)$

$y = af(b(x - h)) + k$



$y = f(x)$

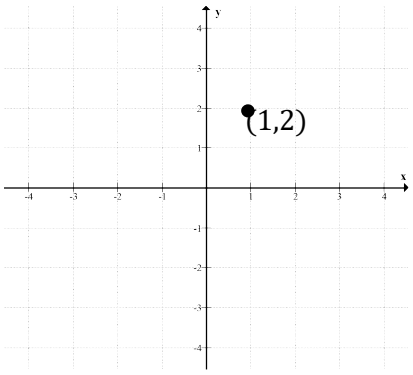
$y = af(b(x - h)) + k$



$y = f(x)$

$y = af(b(x - h)) + k$

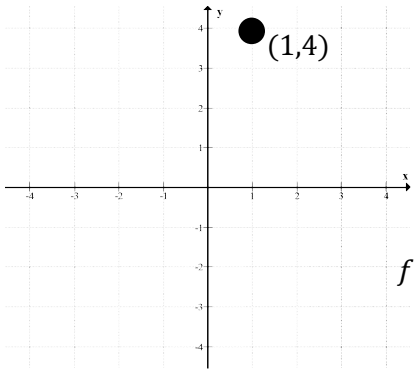
C12 - 1.4 - Point $f^{-1}(x)$ Inverse HW



Point

$(x, f(x)) = (1,2)$

Perform the following operations on the point $(x, f(x))$ *and state the new point and write in mapping notation. Draw the new point on the graph.*



Point

$f(x) = (1,4)$

$y = f^{-1}(x)$

$(2,4) \rightarrow$

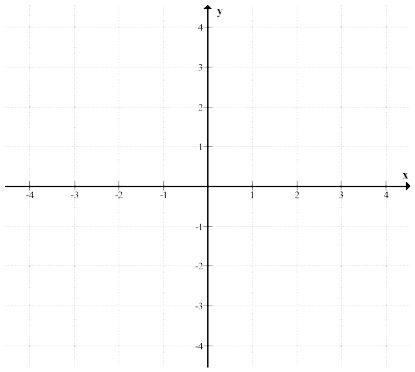
$(-1,3) \rightarrow$

$\left(4, -\frac{1}{2}\right) \rightarrow$

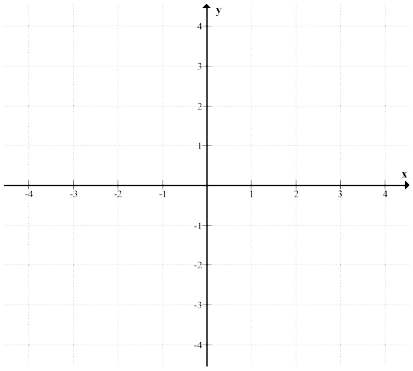
C12 - 1.4 - Graph/Algebra $f^{-1}(x)$ Inverse HW

Find the inverse of the following function and draw both on a graph and label at least 2 points on each

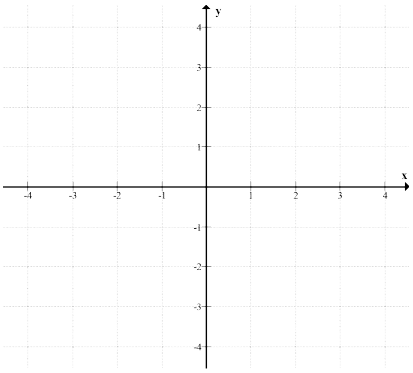
$y = 2x - 4$



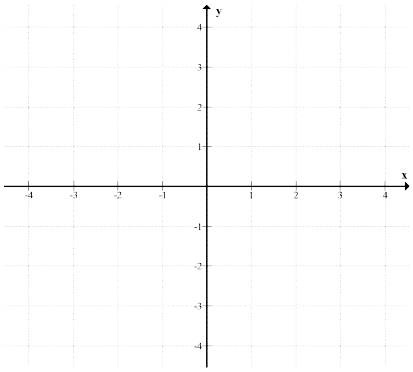
$y = x^2$



$y = \frac{x}{x+2}$



$y = (x+2)^2 - 4$



C12 - 1.5 - Order Matters Point/Functions HW

Find the new point.

$f(x) = (2,1)$

A vertical expansion by a factor of 2
A vertical translation up 2

A vertical translation up 2
A vertical expansion by a factor of 2

$f(x) = (2,4)$

A horizontal compression of a half
A horizontal translation left 2

A horizontal translation left 2
A horizontal compression of a half

Find the new equation.

$f(x) = x^2$

A vertical expansion by a factor of 2
A vertical translation up 2

A vertical translation up 2
A vertical expansion by a factor of 2

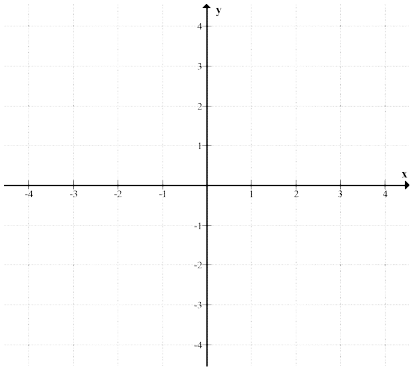
A horizontal expansion by a factor of 2
A horizontal translation left 2

A horizontal translation left 2
A horizontal expansion by a factor of 2

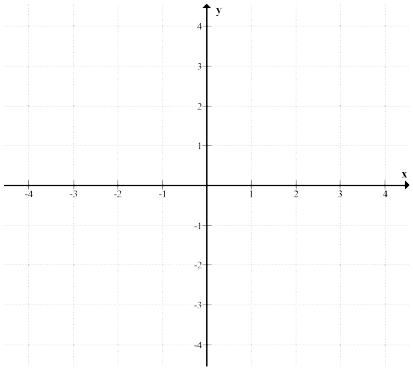
C12 - 2.1 - Radical Translations HW

Draw the following graphs and state the Domain and Range and state the x and y intercepts

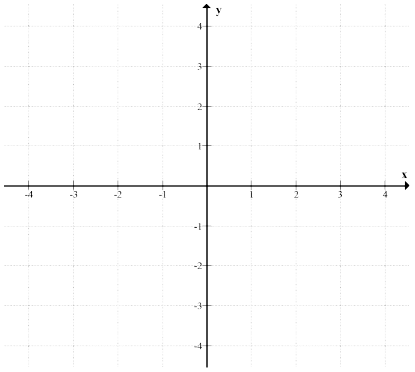
$y = \sqrt{x}$



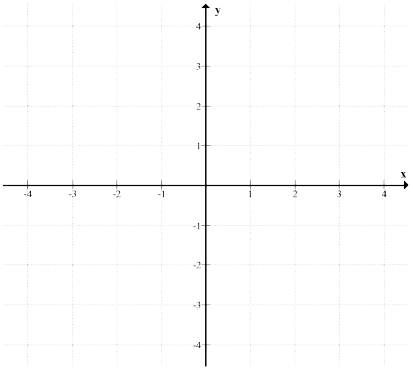
$y = \sqrt{x} - 3$



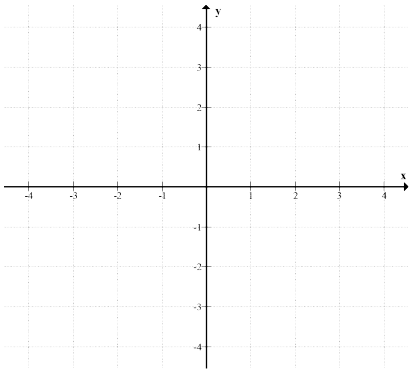
$y = \sqrt{x} + 1$



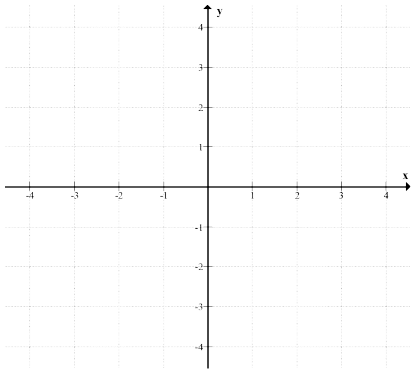
$y = \sqrt{x+3}$



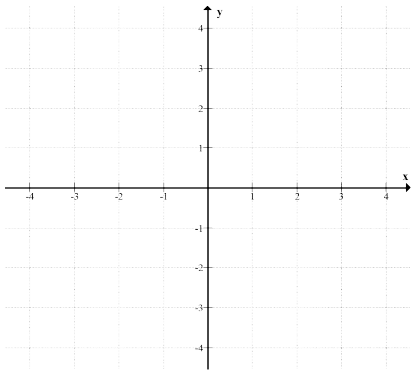
$y = \sqrt{x-1}$



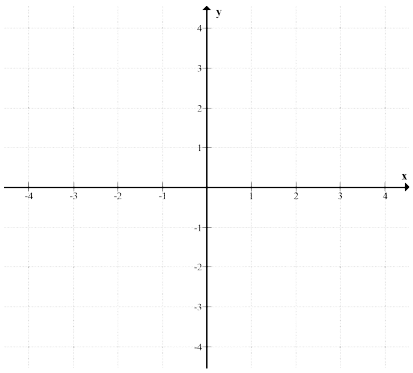
$y = \sqrt{x+5}$



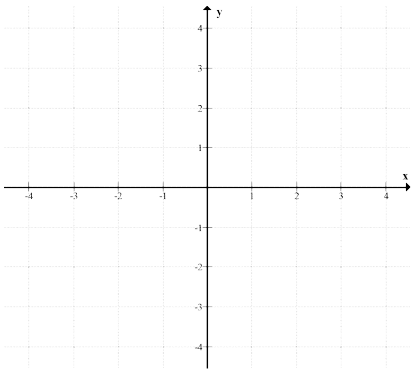
$y = \sqrt{x+1} + 3$



$y = \sqrt{x-1} + 1$



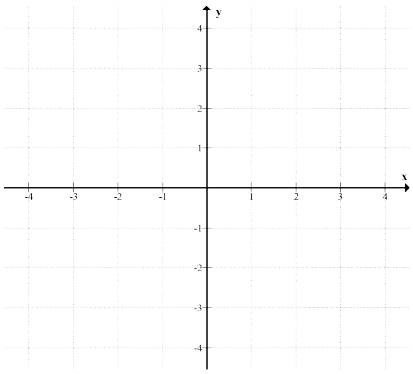
$y = \sqrt{x+5} - 2$



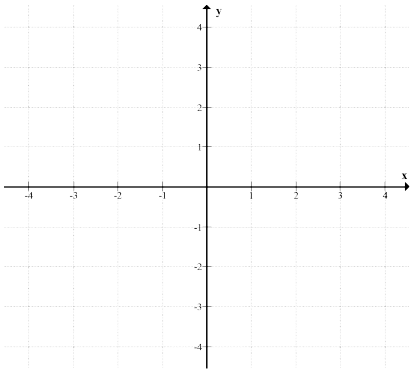
C12 - 2.2 - Radical Transformations HW

Draw the following graphs and state the Domain and Range and state the x and y intercepts

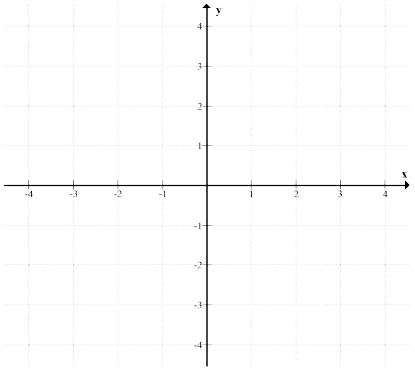
$y = 2\sqrt{x}$



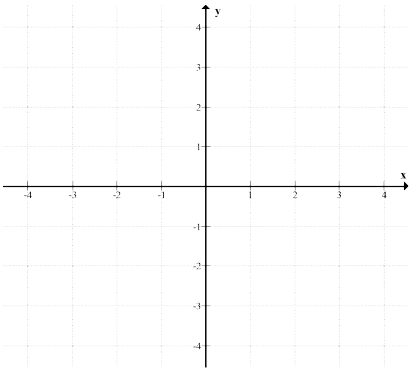
$y = \frac{1}{2}\sqrt{x}$



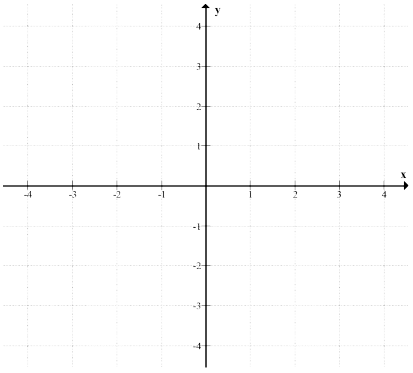
$y = 3\sqrt{x}$



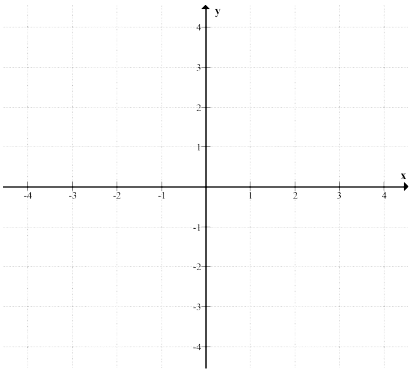
$y = \sqrt{2x}$



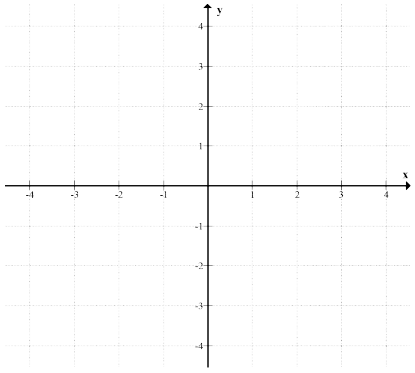
$y = \sqrt{\frac{1}{2}x}$



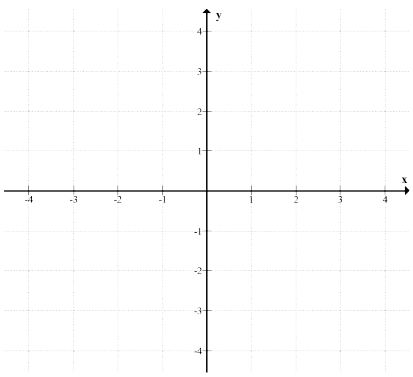
$y = \sqrt{3x}$



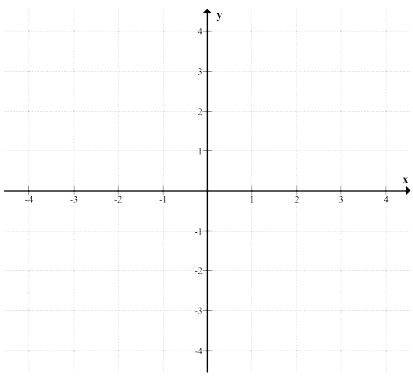
$y = 2\sqrt{\frac{1}{2}x}$



$y = \frac{1}{2}\sqrt{2x}$



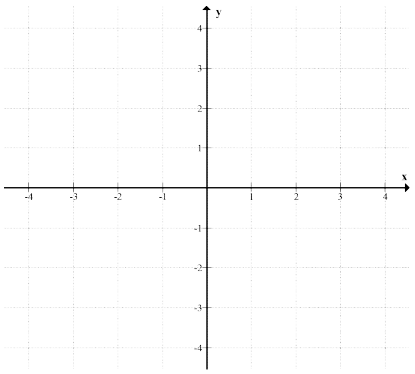
$y = 2\sqrt{2x}$



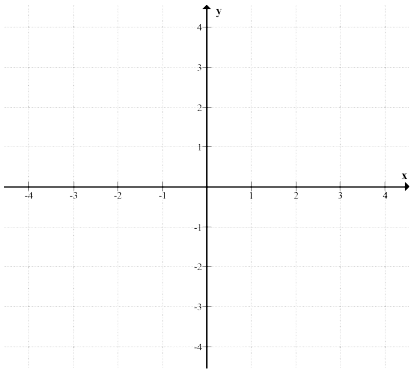
C12 - 2.3 - Radical Reflections HW

Draw the following graphs and state the Domain and Range and state the x and y intercepts

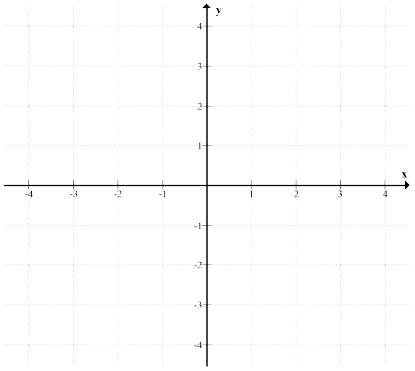
$y = -\sqrt{x}$



$y = \sqrt{-x}$

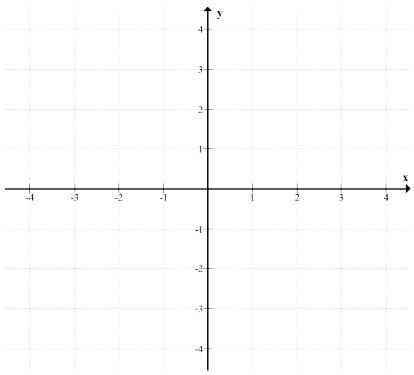


$y = -\sqrt{-x}$

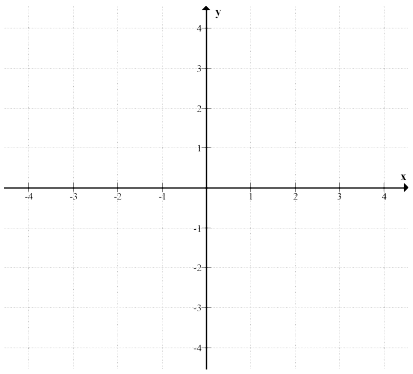


Draw the following graphs and state the Domain and Range and state the x and y intercepts

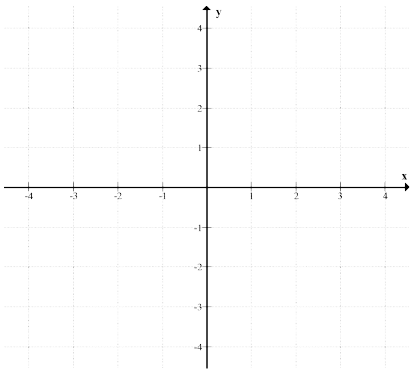
$y = -\sqrt{x} + 1$



$y = \sqrt{-(x+2)}$



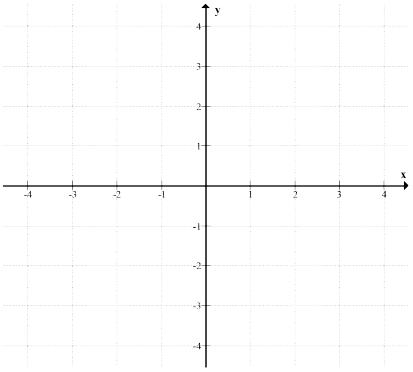
$y = \sqrt{-x+2}$



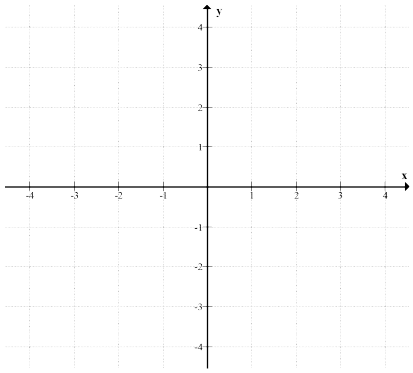
C12 - 2.123 - Radical Combo Transformations HW

Draw the following graphs and state the Domain and Range and state the x and y intercepts

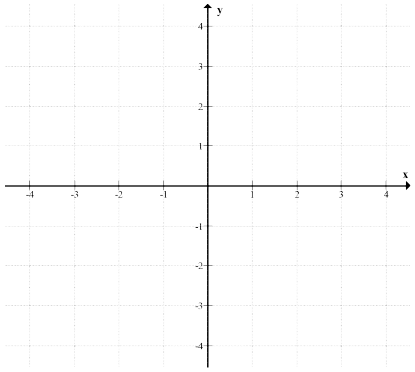
$y = 2\sqrt{x} + 1$



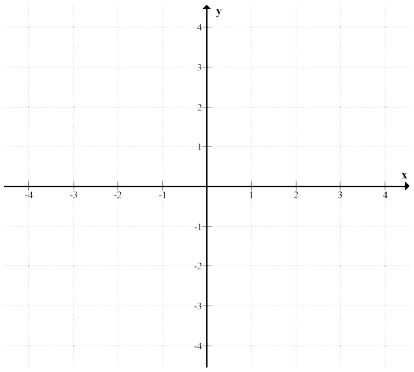
$y = \frac{1}{2}\sqrt{x} - 2$



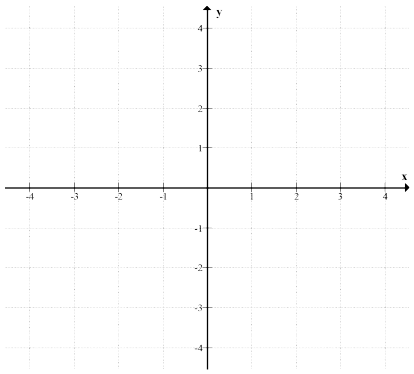
$y = \sqrt{\frac{1}{2}x + 1}$



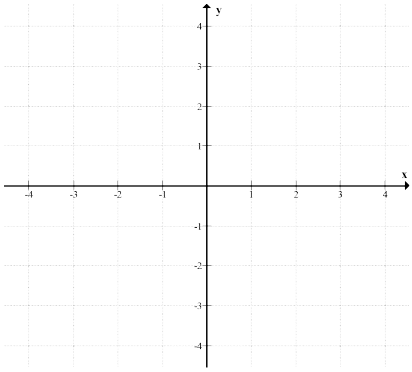
$y = \sqrt{2x} - 1$



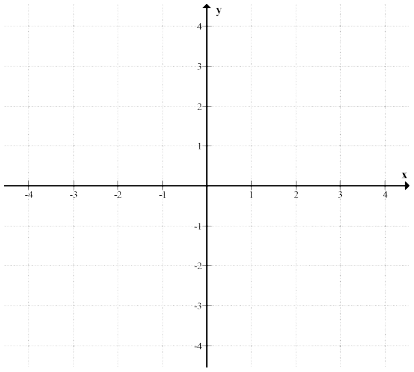
$y = 2\sqrt{x+1}$



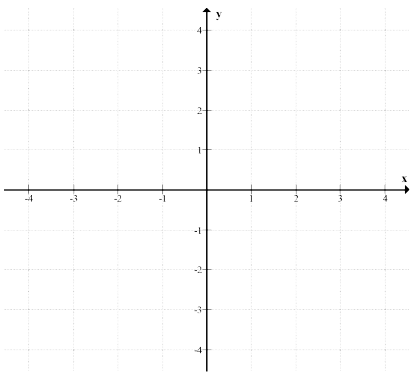
$y = 2\sqrt{x-1}$



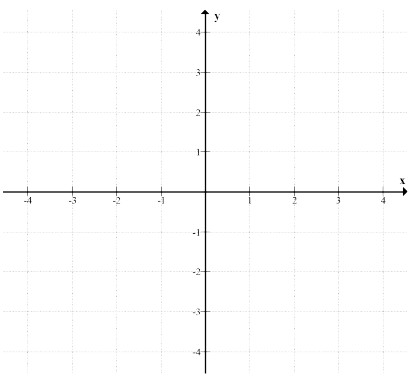
$y = 2\sqrt{-x}$



$y = -\sqrt{2x}$



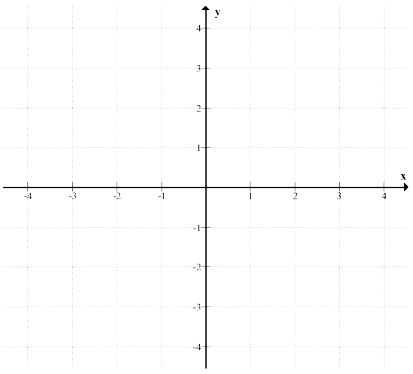
$y = -\sqrt{x+1} - 2$



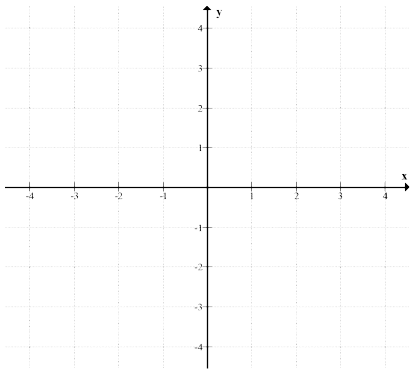
C12 - 2.123 - Radical Combo Transformations HW

Draw the following graphs and state the Domain and Range and state the x and y intercepts

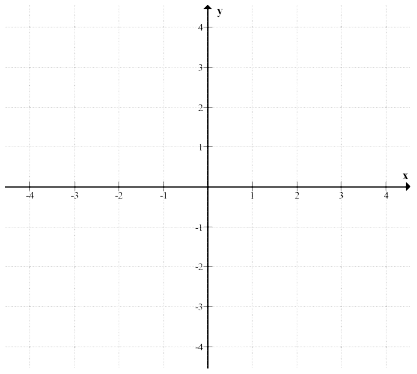
$y = -2\sqrt{x} + 1$



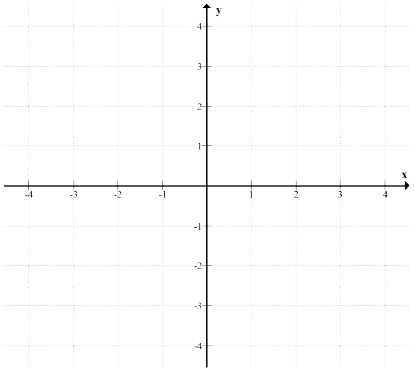
$y = \frac{1}{2}\sqrt{-x} - 2$



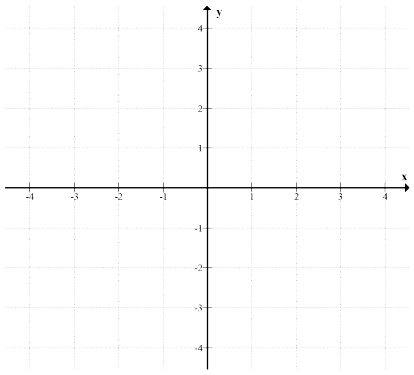
$y = \sqrt{\frac{1}{2}(x-1)} + 1$



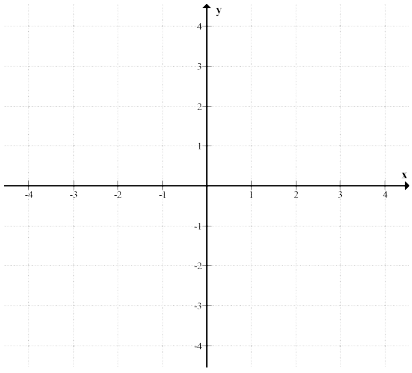
$y = \sqrt{-2x} - 1$



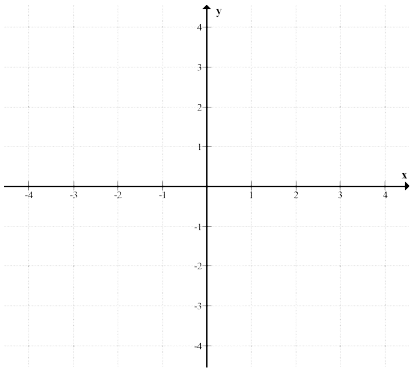
$y = \sqrt{2(x+1)}$



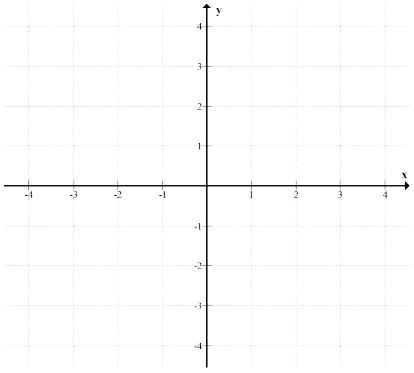
$y = \sqrt{2x+2}$



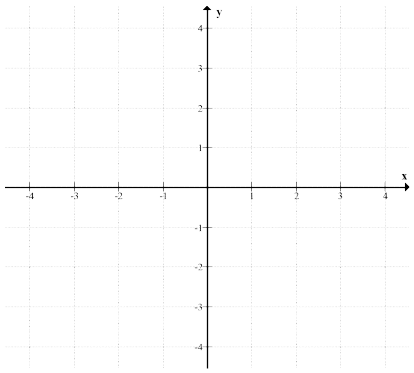
$y = \sqrt{1-x}$



$y = \sqrt{2x-1}$

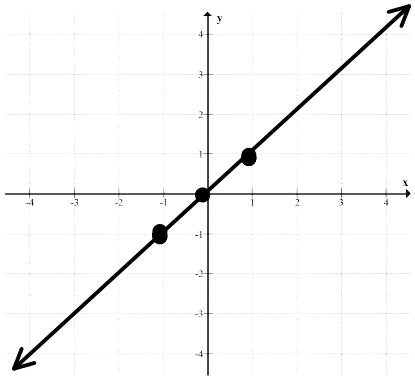


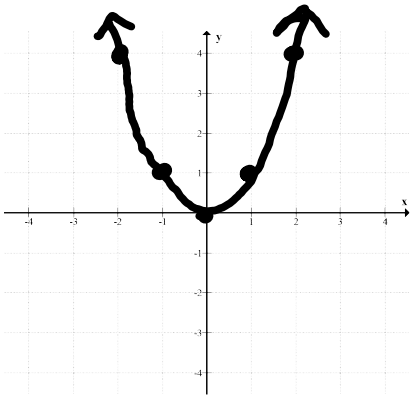
$y = -\frac{1}{2}\sqrt{2(x-1)} + 3$

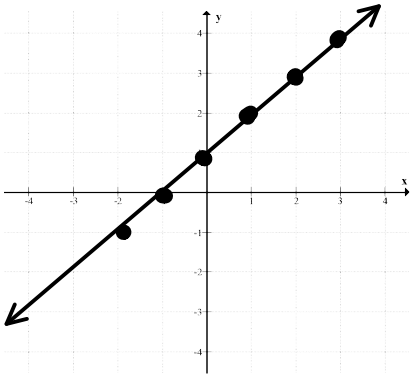


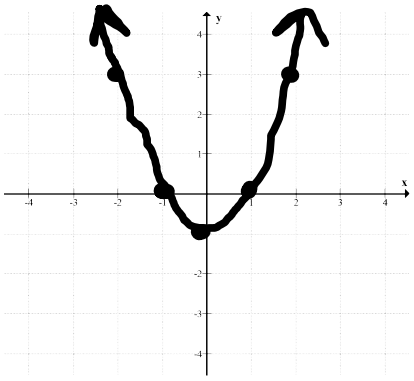
C12 - 2.4 - Square Root Functions HW

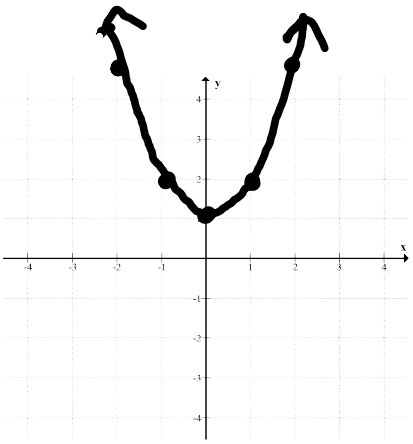
Draw the graph of $\sqrt{f(x)}$ *from the graph of* $f(x)$ *and label the invariant points and state the domain and range.*

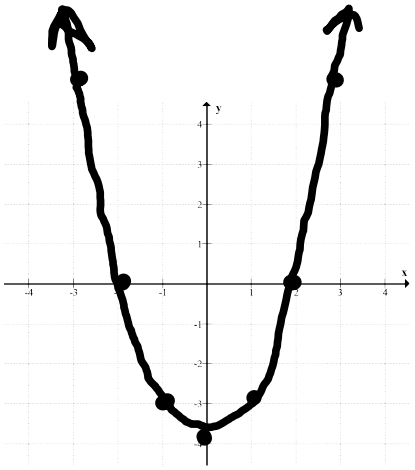












C12 - 3.1 - Long Division WS

Divide using long division and state the division statement and the multiplication statement. Find Remainder.

$3\overline{)\,36}$

$3\overline{)\,35}$

$(x-2)\overline{)\,x^2+2x-8}$

$(x-3)\overline{)\,x^2+4x-22}$

$(x-3)\overline{)\,x^3-2x^2-5x+6}$ Fully Factor

$(x+2)\overline{)\,3x^2+5x-2}$

$(x+4)\overline{)\,2x^2+9x-1}$

$(x+5)\overline{)\,x^2+9x+20}$

C12 - 3.1 - Synthetic Division WS

Divide using synthetic division and state the division statement and the multiplication statement. Fully Factor.

$$\frac{x^2 + 2x - 8}{x - 2}$$

$$\frac{x^3 - 2x^2 - 5x + 6}{x + 2}$$

$$\frac{x^3 + 2x^2 - 5x - 7}{x + 2}$$

$$\frac{x^3 + 2x^2 - 4x - 8}{x + 2} \qquad \frac{x^3 + x^2 - 4x - 4}{x - 2} \qquad \frac{x^3 + 6x^2 + 8}{x + 3} \qquad \frac{x^3 - 2x^2 - 5x + 8}{(x - 3)}$$

C12 - 3.2 - Factor/Remainder Theorem Synthetic Long Division WS

Is the following a factor of the polynomial. Test by Inspection. Factor using synthetic or long division.

$(x-1)$ x^3-2x^2-5x+6

$(x+3)$ x^3+x^2-4x-4

$(x+2)$ x^3-2x^2-5x+6

$(x-3)$ x^3+x^2-4x-4

$(x-2)$ x^3+2x^2-4x-8

$(x+3)$ $x^3+6x^2+12x+8$

$(x-2)$ x^3-2x^2-5x+7

$(x+1)$ x^3+x^2-4x-1

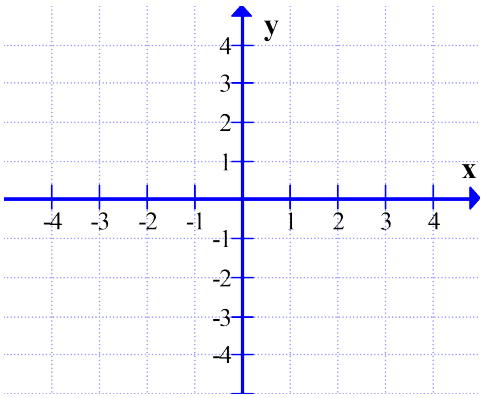
$(x-3)$ x^3-2x^2-5x-2

$(x+2)$ x^3+x^2-4x+2

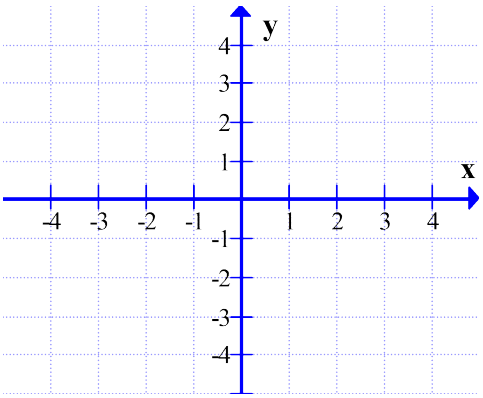
C12 - 3.3 - Factoring WS

Factor and state the x and y-intercepts and draw a graph

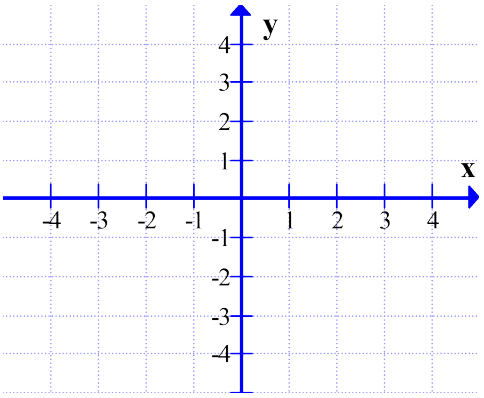
$x^2 - 4x + 3$



$x^3 - 2x^2 - 5x + 6$



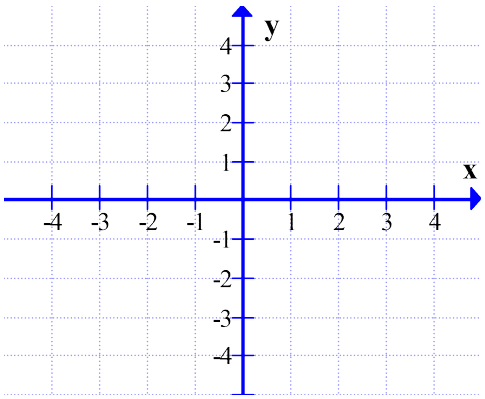
$-x^3 - 2x^2 + 5x + 6$



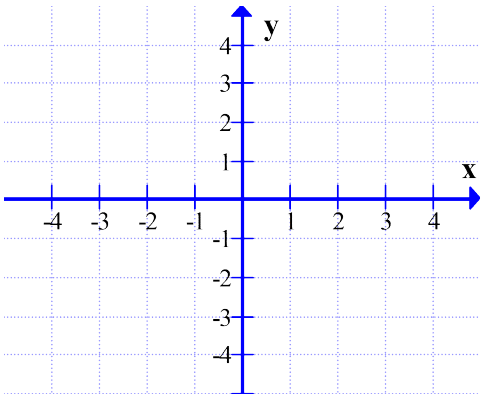
C12 - 3.3 - Factoring WS

Factor and state the x and y-intercepts and draw a graph

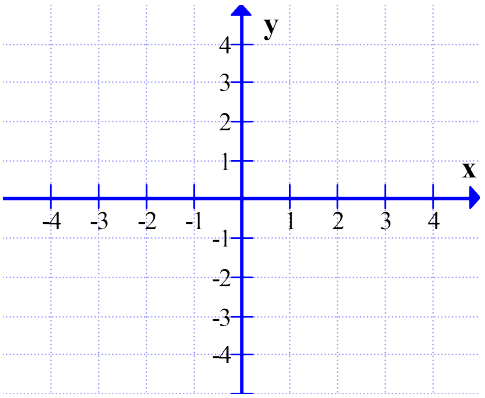
$x^3 + 2x^2 - 4x - 8$



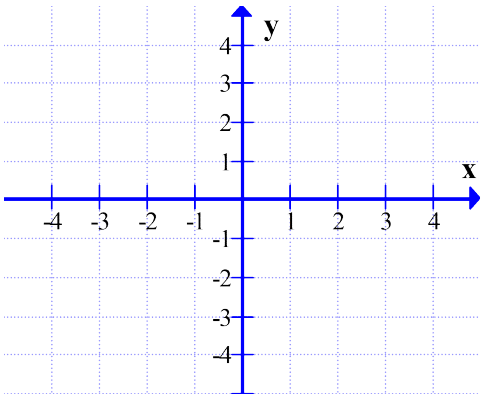
$x^4 - 2x^3 + 2x - 1$



$x^3 - 3x + 2$



$-x^3 + 3x^2$

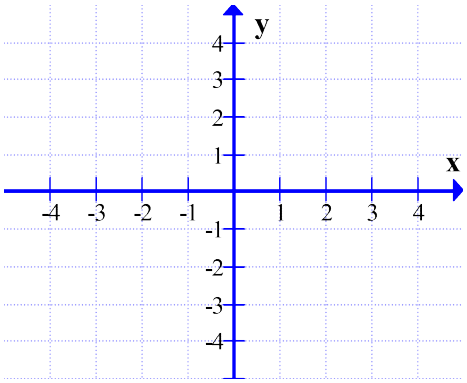


C12 - 3.4 - Graph Factored Form WS

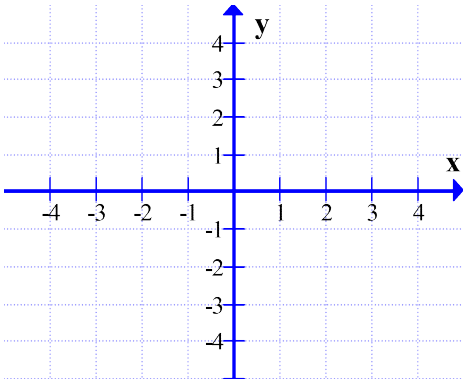
$y = a(x \pm \#)(x \pm \#)(x \pm \#) \ldots$

Find the leading term, and graph. Sketch a graph and label x and y intercepts.

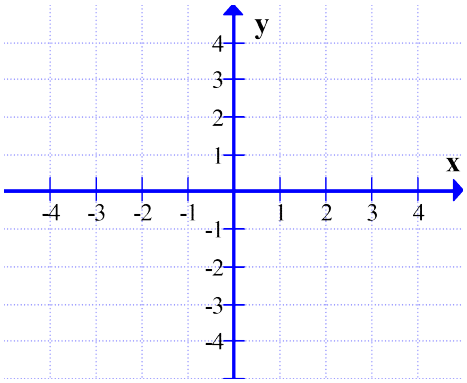
$f(x) = (x+1)(x-2)(x+2)$



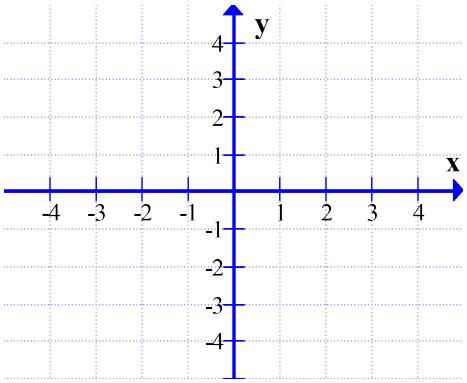
$f(x) = (x-2)(x-1)(x+4)$



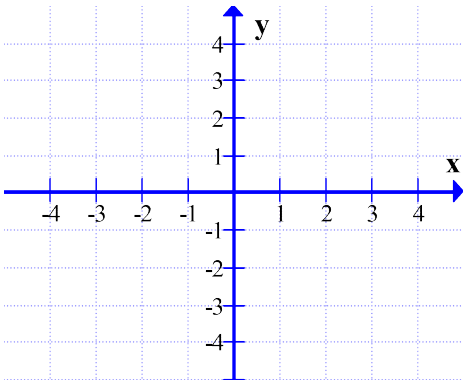
$f(x) = -(x-1)(x+2)(x-3)$



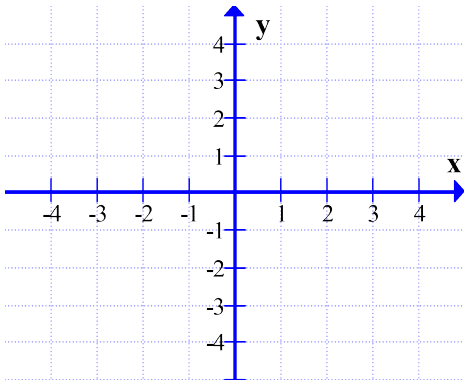
$f(x) = (x+2)^2(x-2)$



$f(x) = (x-1)^2(2-x)$



$f(x) = -(x+2)^3(1-x)$



C12 - 3.4 - Graph Factored Form WS

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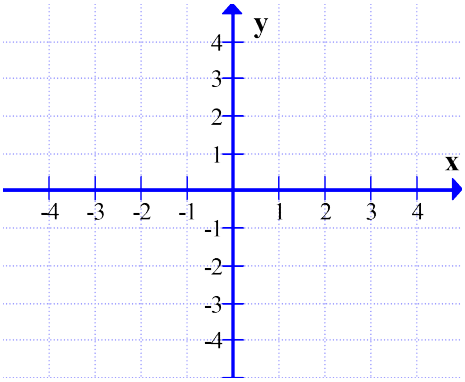
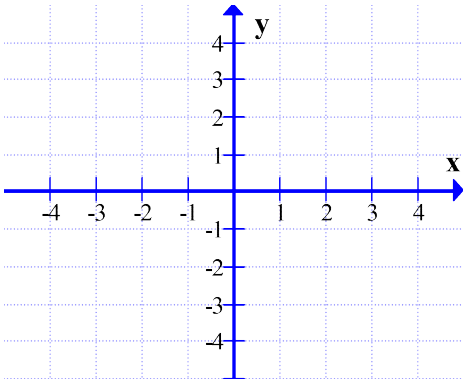
Find the leading term, and graph. Sketch a graph and label x and y intercepts.

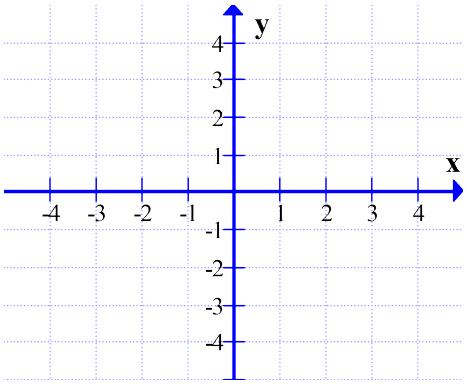
$f(x) = -(x+1)(x-2)(x+2)$



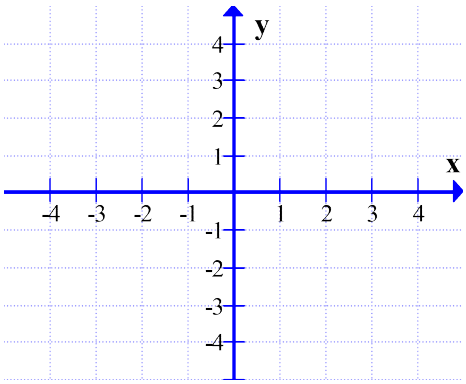
$f(x) = -(x+1)(x-1)(x+4)$



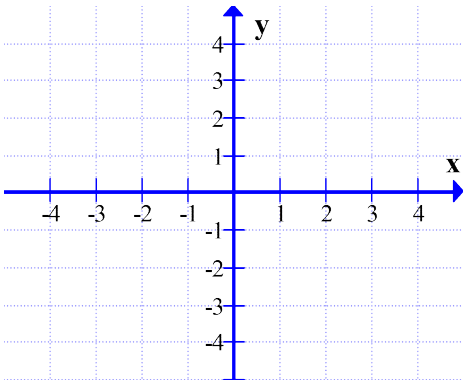
$f(x) = (x-1)^2(x+2)(x-3)^3$



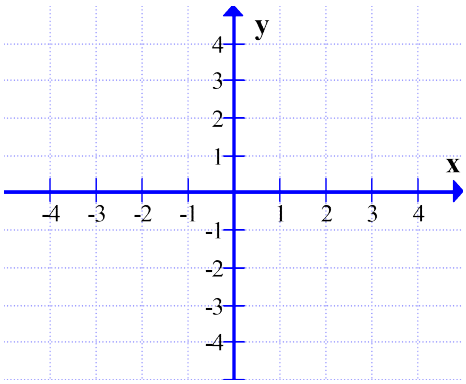
$f(x) = (x+2)(x+2)(x-2)(x-2)$



$f(x) = x(x-1)^2(x+2)$



$f(x) = -x(x+2)^3(x-1)$

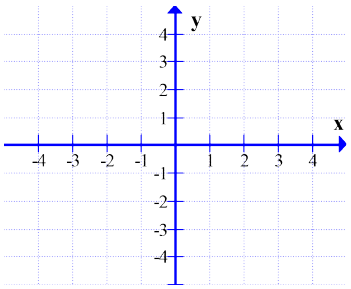


C12 - 3.4 - $x-int, y-int$ to Factored form WS

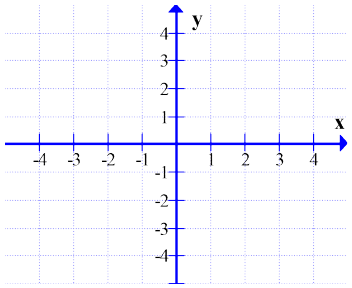
Find Equation in factored form, find the leading term, and graph.

$y = a(x \pm \#)^{\#}(x \pm \#)^{\#}(x \pm \#)^{\#} \ldots$

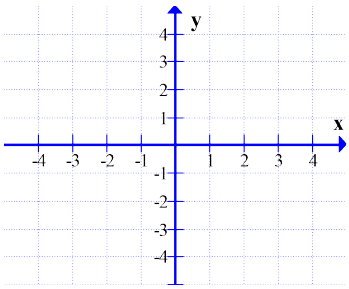
$x-int = 1,3$
$y-int = 3$



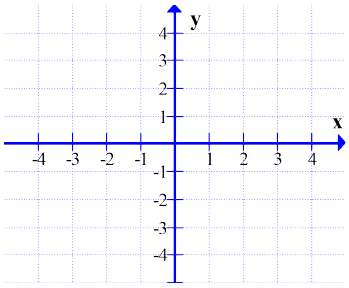
$x-int = 1,3$
$y-int = 6$



$x-int = -4,-2,1$
$y-int = 4$



$x-int = -2,0,2$



$x-int = -1,1,1$
$y-int = 1$

$x-int = -2,1,3$
$y-int = 6$

$x-int = -2,-2,2$
$y-int = -8$

$x-int = -2,-2,-2$
$y-int = 4$

C12 - 3.5 - Open Rectangular Box Cut Side x WS

An open rectangular box is made by cutting equal lengths from each corner of a 10 cm by 8 cm rectangular piece of cardboard, then folding up the sides. Find the length of the square that must be cut from each corner so the box has a volume of 48 cm^3. And find Max Volume. x=1,2, V=52.52

C12 - 3.5 - Word Problems

An open rectangular box is made by cutting equal lengths from each corner of a 4 cm by 6 cm rectangular piece of cardboard, then folding up the sides. Find the length of the square that must be cut from each corner so the box has a volume of 8 cm^3. And find Max Volume. x=1, V=8.45

5 cm by 7 cm: volume of 6 cm^3. x=2, V=15.02

9 cm by 11 cm: volume of 45 cm^3. x=3, V=72.42

A box of 1 cm^3 length's are increased by the same amount. Find the increase, the new dimensions and Volume if the new volume is 8 times larger. x=1. 27 times larger. x=2

A box of 1x2x3 cm length's are increased by the same amount. Find the increase, the new dimensions and Volume if the new volume is 20 times larger. x=3. 4x5x6, V=120

1x2x3, 35 times larger. x=4, 5x6x7, V=210

1x2x3, 10 times larger. x=2, 3x4x5, V=210

A cylinder with the same radius as its height. Find the dimensions if the Volume is $\pi. 8\pi. 27\pi$

A cylinder with radius and height both 2 cm. Find the dimensions if both are increased by the same amount to have a Volume of $64\pi. \mathrm{x} = 2$. Volume of 27π. x=1

A cylinder with radius 2 cm and height 3 cm. Find the dimensions if both are increased by the same amount to have a Volume of $36\pi. \mathrm{x} = 1$. Volume of $80\pi. \mathrm{x} = 2$. Volume of $150\pi. \mathrm{x} = 3$

A company has the following revenue and cost functions on units: $R(x) = x^3 \; and \; C(x) = 6x^2 - 11x - 6$. Find the number of units to break even. To profit \$24. To profit \$60. To profit \$720.

C12 - 4.1 - Degree/Radian Conversion HW

Degrees to Radians: **Radians to Degrees:**

$\frac{180^o}{\pi} = \frac{\pi}{180^o}$ $\times \frac{\pi}{180^o}$ $\times \frac{180^0}{\pi}$

π *and* 180^o *are the same thing, just in different units*

Find θ *in radians*

40^0 60^0 100^0

135^0 10^0 0^0

29^0 420^0 330^0

Find θ *in degrees*

$\frac{\pi}{6}_{rad}$ $\frac{\pi}{12}_{rad}$ $\frac{5\pi}{3}_{rad}$

$\frac{3\pi}{5}_{rad}$ $\frac{2\pi}{5}_{rad}$ $\frac{2\pi}{7}_{rad}$

3.14_{rad} 5.12_{rad} 7_{rad}

2 10 1

C12 - 4.1 - Fill in blanks degrees/radians WS

15^0,	30^0,	45^0,	_____,	_____,	_____,	_____,	_____,
$\frac{\pi}{12}$,	$\frac{2\pi}{12}$,	$\frac{3\pi}{12}$,	_____,	_____,	_____,	_____,	_____,
Simplify _____,	_____,	_____	_____,	_____,	_____,	_____,	_____

30^0,	60^0,	90^0,	_____,	_____,	_____,	_____,	_____,
$\frac{2\pi}{12}$,	$\frac{4\pi}{12}$,	$\frac{6\pi}{12}$,	_____,	_____,	_____,	_____,	_____,
_____,	_____,	_____	_____,	_____,	_____,	_____,	_____

45^0,	90^0,	135^0,	_____,	_____,	_____,	_____,	_____,
$\frac{3\pi}{12}$,	$\frac{6\pi}{12}$,	$\frac{9\pi}{12}$,	_____,	_____,	_____,	_____,	_____,
_____,	_____,	_____	_____,	_____,	_____,	_____,	_____

60^0,	120^0,	180^0,	_____,	_____,	_____,	_____,	_____,
$\frac{4\pi}{12}$,	$\frac{8\pi}{12}$,	$\frac{12\pi}{12}$,	_____,	_____,	_____,	_____,	_____,
_____,	_____,	_____	_____,	_____,	_____,	_____,	_____

90^0,	180^0,	270^0,	_____,	_____,	_____,	_____,	_____,
$\frac{\pi}{2}$,	$\frac{2\pi}{2}$,	$\frac{3\pi}{2}$,	_____,	_____,	_____,	_____,	_____,
_____,	_____,	_____,	_____,	_____,	_____,	_____,	_____,

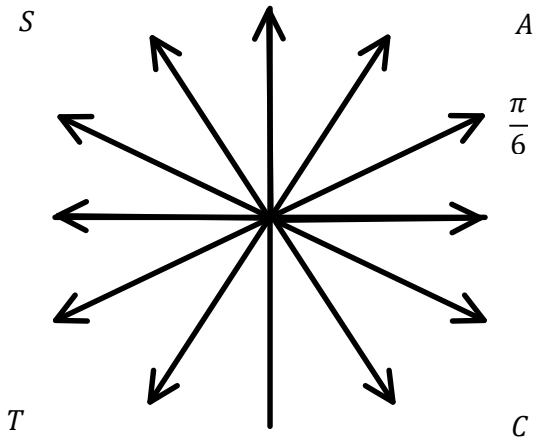
180^0,	360^0,	540^0,	_____,	_____,	_____,	_____,	_____,
π,	2π,	3π,	_____,	_____,	_____,	_____,	_____,

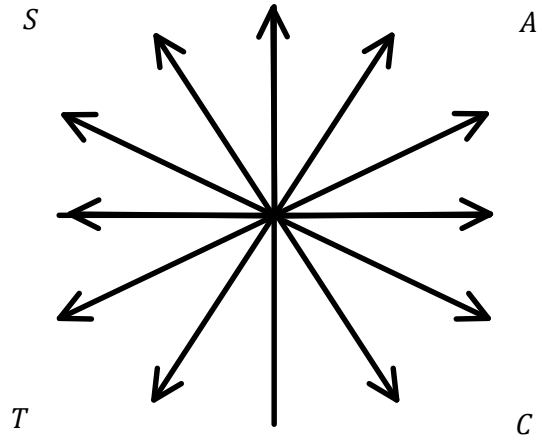
360^0,	720^0,	1080^0,	_____,	_____,	_____,	_____,	_____,
2π,	4π,	6π,	_____,	_____,	_____,	_____,	_____,

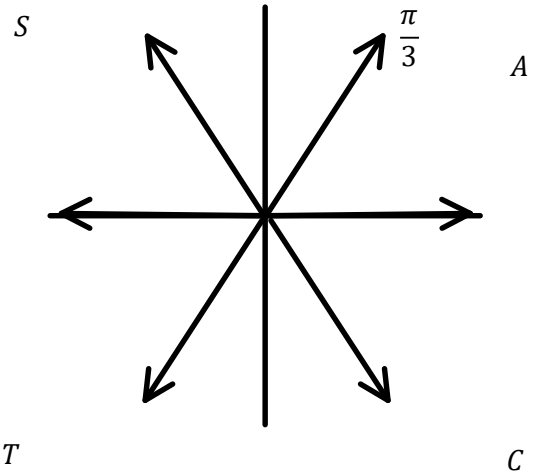
C12 - 4.1 - $\frac{\#\pi}{\#}$ HMK

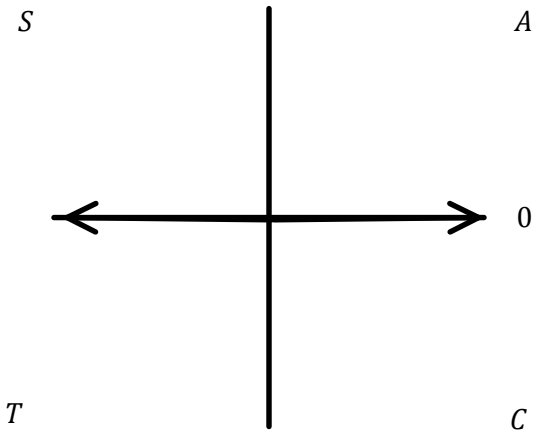
Label each terminal arm θ_{stp}.

Simplify

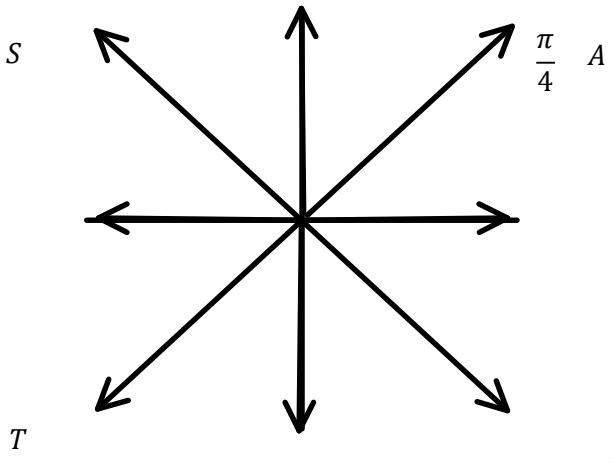


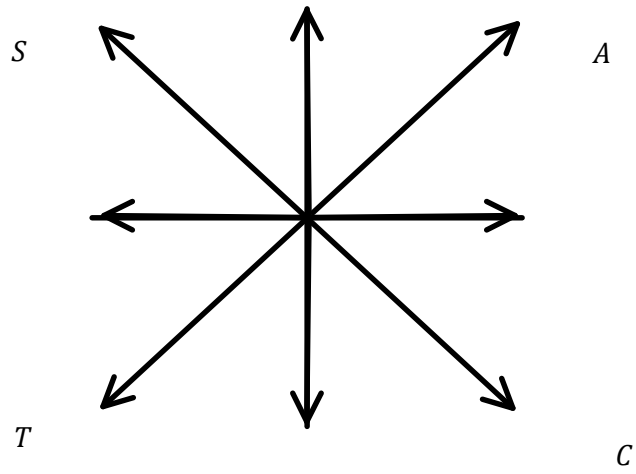






Simplify

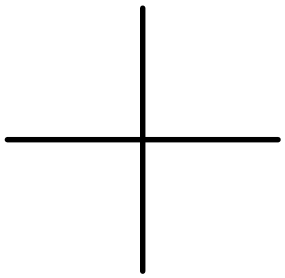




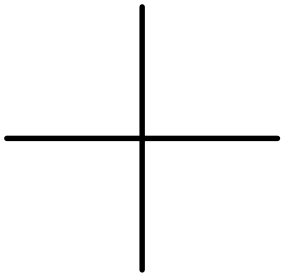
C12 - 4.2 - Special $Sketch\ \theta_{stp}, Find\ \theta_r, HW$

Sketch θ_{stp}, Find θ_r.

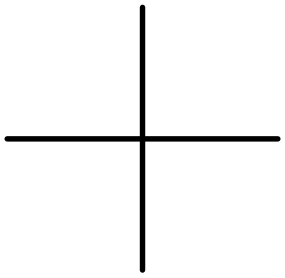
$\frac{\pi}{3}$



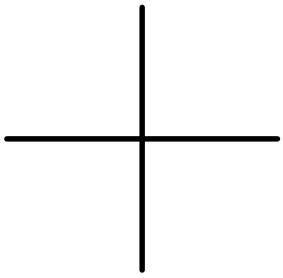
$\frac{5\pi}{4}$



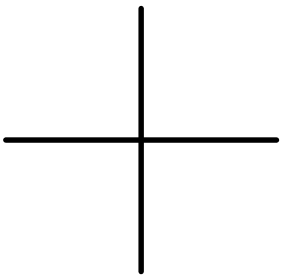
$\frac{\pi}{2}$



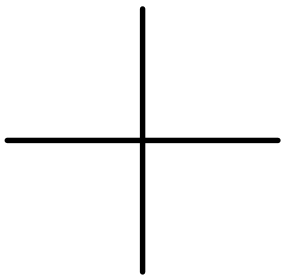
$\frac{11\pi}{6}$



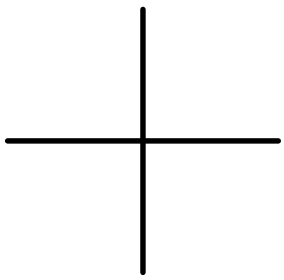
$\frac{4\pi}{3}$



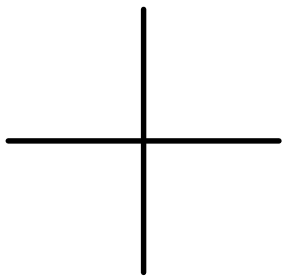
$\frac{\pi}{6}$



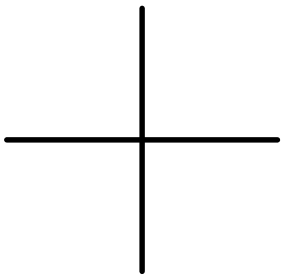
$\frac{\pi}{4}$



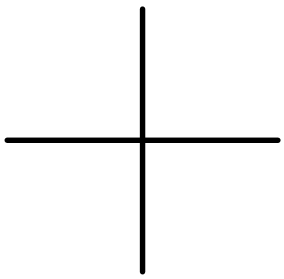
$\frac{5\pi}{6}$



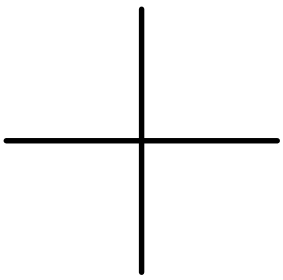
$\frac{7\pi}{4}$



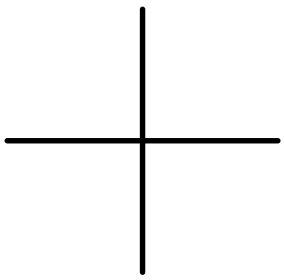
2π



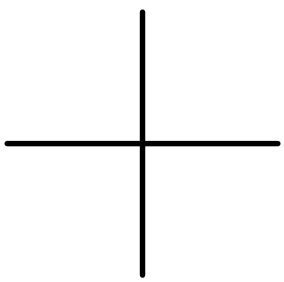
$\frac{3\pi}{4}$



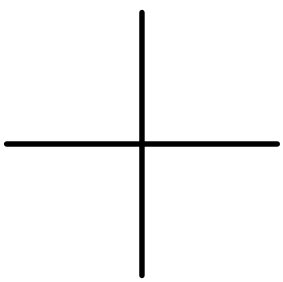
$\frac{3\pi}{2}$



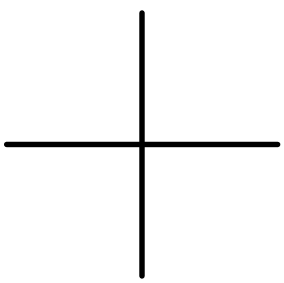
$\frac{5\pi}{3}$



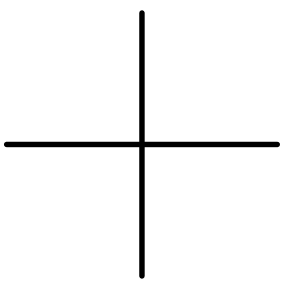
π



$\frac{7\pi}{6}$



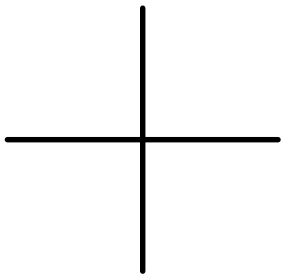
$\frac{2\pi}{3}$



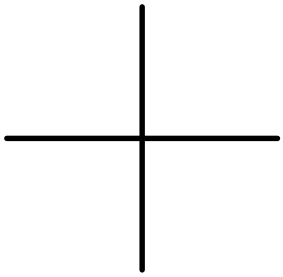
C12 - 4.2 - Odd/Dec $Sketch\ \theta_{stp}, Find\ \theta_r, HW$

Sketch θ_{stp}, Find θ_r.

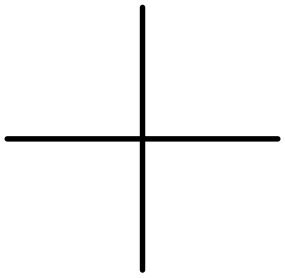
$\frac{\pi}{5}$



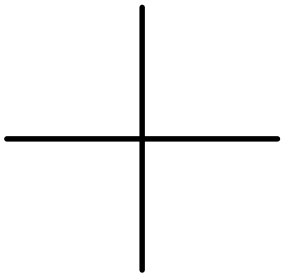
$\frac{5\pi}{7}$



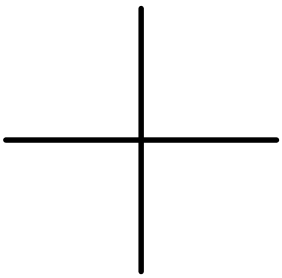
0.64



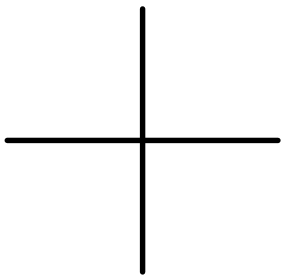
$\frac{11\pi}{12}$



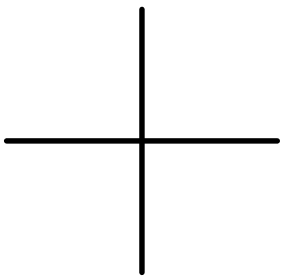
$\frac{4\pi}{5}$



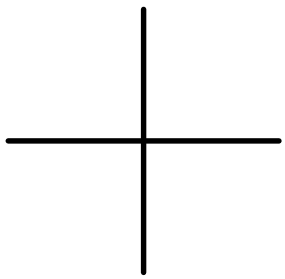
$\frac{\pi}{7}$



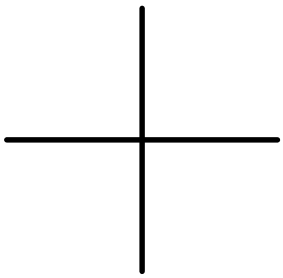
1.70



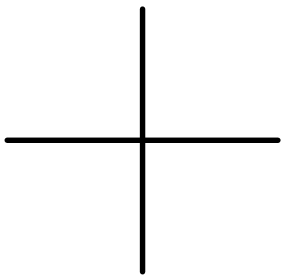
$\frac{5\pi}{8}$



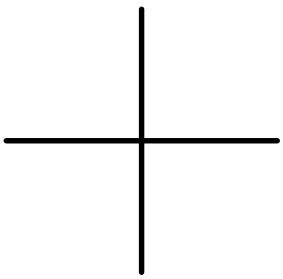
$\frac{7\pi}{12}$



5.2



$\frac{3\pi}{8}$



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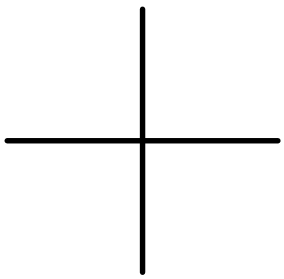
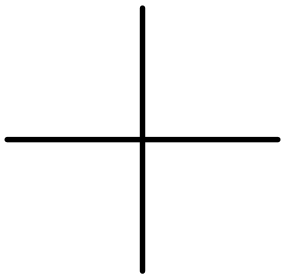
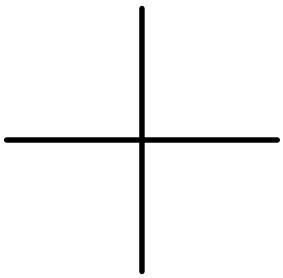


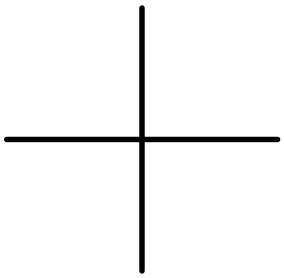
$\frac{5\pi}{11}$



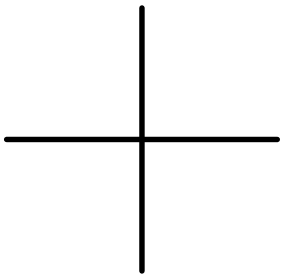
$\frac{3\pi}{11}$



3.6



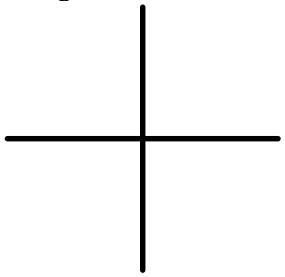
$\frac{2\pi}{9}$



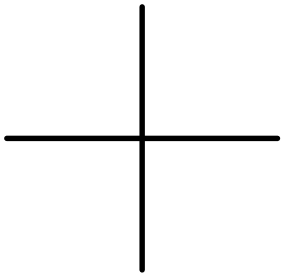
C12 - 4.2 - Cot $Sketch, Find\ \theta_{cot}, \theta_{gen}\ HW$

Sketch θ_{stp}, *Find a* $\theta_{cot,}$ *and* θ_{gen}.

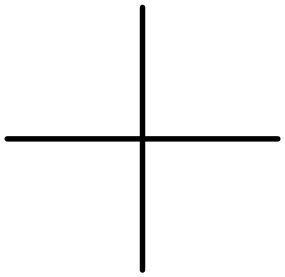
$\frac{\pi}{3}$



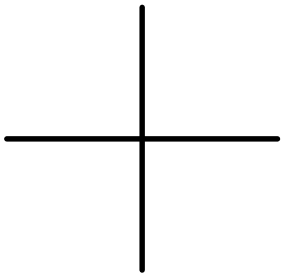
1.67



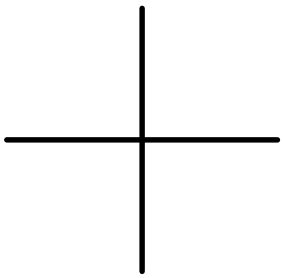
$\frac{\pi}{7}$



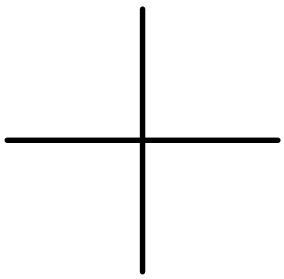
$\frac{3\pi}{4}$



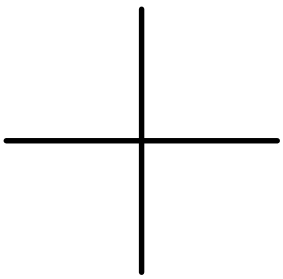
π



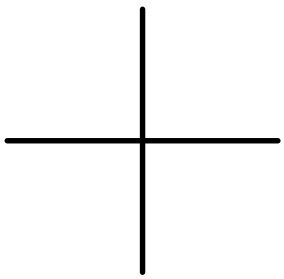
$\frac{\pi}{2}$



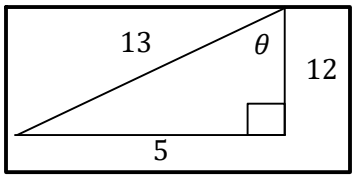
$\frac{3\pi}{5}$



6.28



C12 - 4.3 - Find Ratio/Type in Calc HW



$sin\theta =$ $csc\theta =$ $cos\theta =$ $sec\theta =$ $tan\theta =$ $cot\theta =$

Type in Calculator (Degrees or Radians)

$sin14^0 =$ $csc25^0 =$ $sec105^0 =$ $cot150^0 =$

$cos274^0 =$

$sin60^0 =$

$\tan(-240^0) =$

$sin1.7 =$ $csc5.9 =$ $\sec\left(\frac{2}{7}\right) =$ $cot0.6 =$

$\cos\frac{\pi}{6} =$

$\tan(3\pi) =$

$cos2\pi =$

Find θ in Degrees

$sin\theta = \frac{3}{8}$ $sec\theta = \frac{7}{3}$

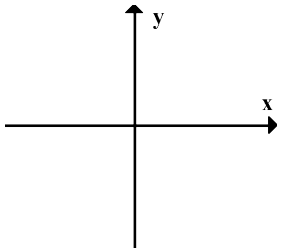
Find θ in Radians

$cos\theta = 0.9$ $cot\theta = 5$

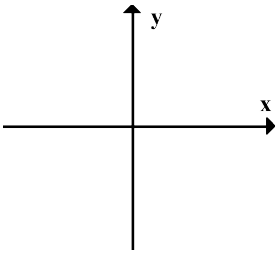
C12 - 4.3 - ASTC *HW*

Draw 2 triangles in the quadrants for the following statements

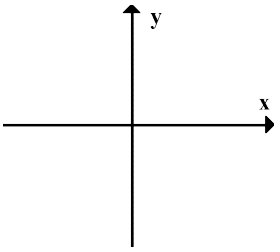
$\cos\theta > 0$



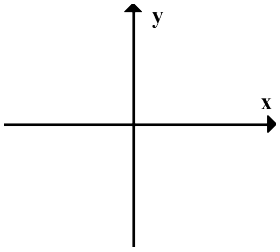
$\tan\theta > 0$



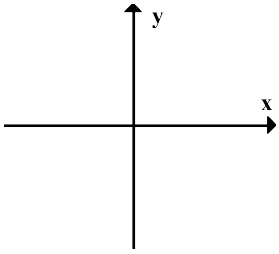
$\sin\theta > 0$



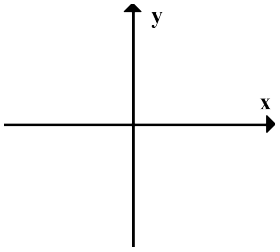
$\cos\theta < 0$



$\tan\theta < 0$

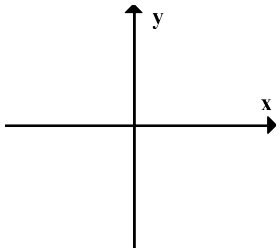


$\sin\theta < 0$

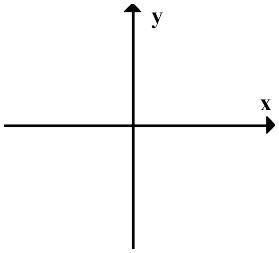


Draw a triangle in the quadrant for following statements

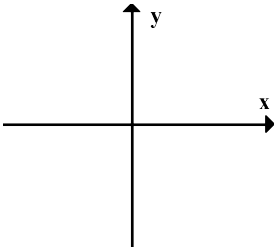
$\cos\theta > 0$ *and* $\sin\theta < 0$



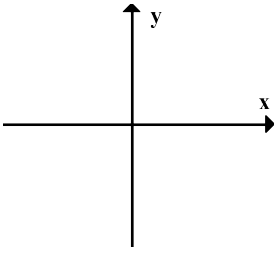
$\cos\theta < 0$ *and* $\tan\theta > 0$



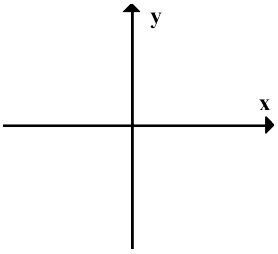
$tan\theta > 0$ *and* $\sin\theta > 0$



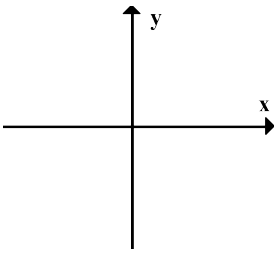
$\cos\theta < 0$ *and* $\sin\theta < 0$



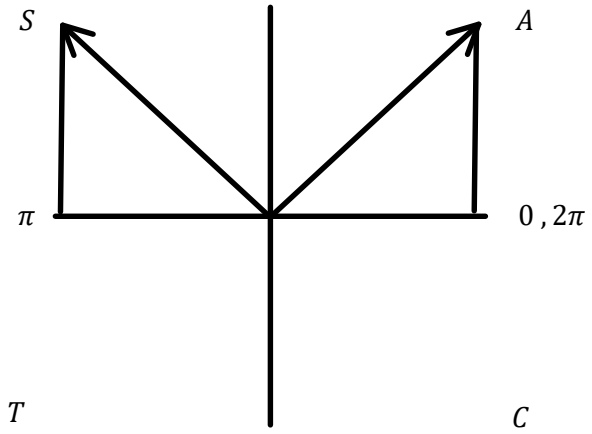
$\cos\theta < 0$ *and* $\tan\theta < 0$

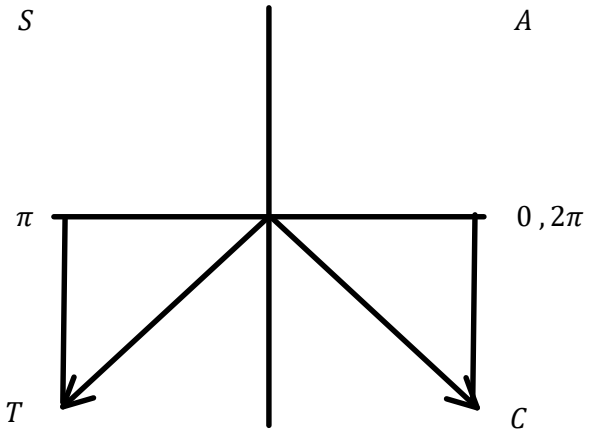


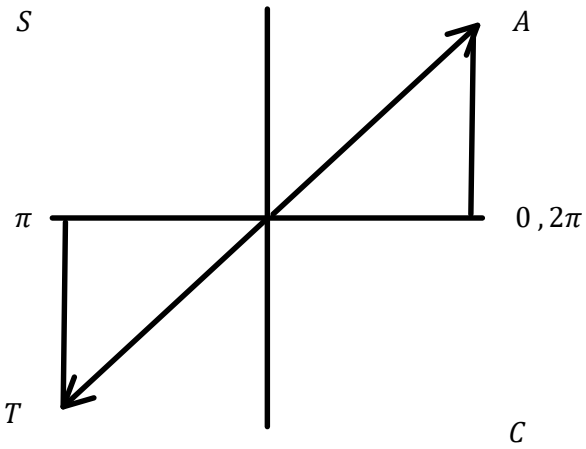
$tan\theta < 0$ *and* $\sin\theta > 0$

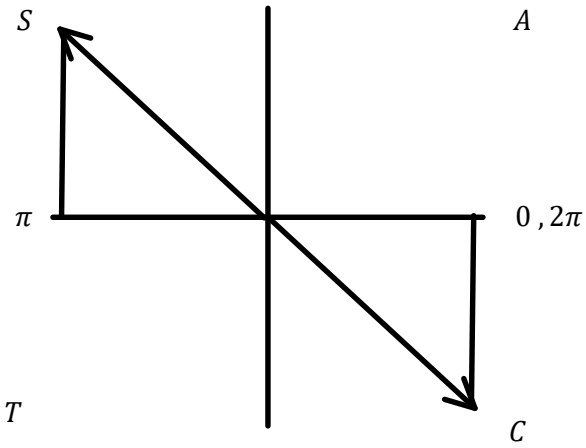


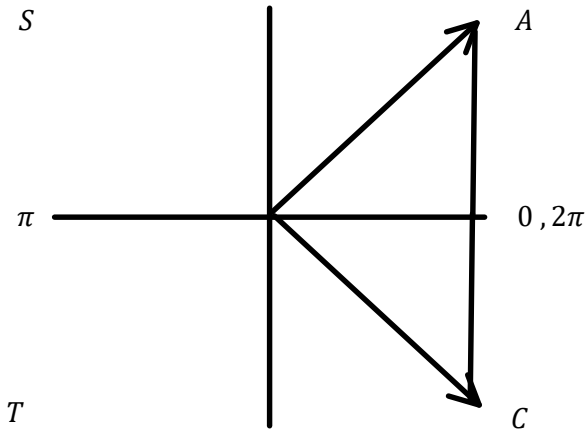
C12 - 4.3 - Draw $\theta_{stp}\ 0 \leq \theta < 2\pi\ HMK$

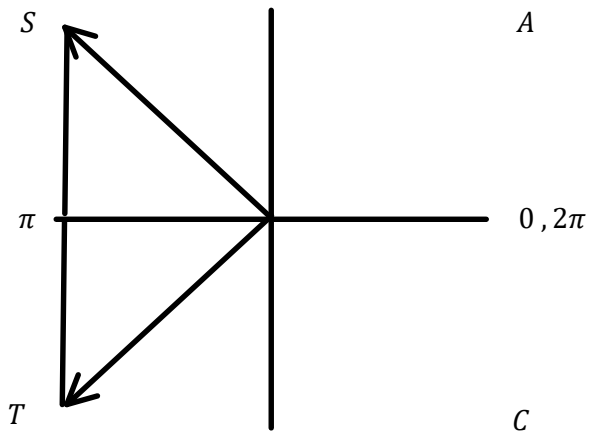








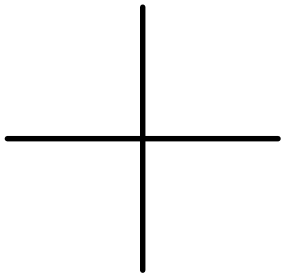




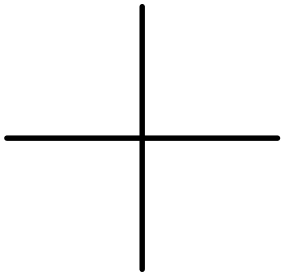
C12 - 4.3 - Solve $sin\theta, cos\theta, tan\theta = ?$ HMK

Solve

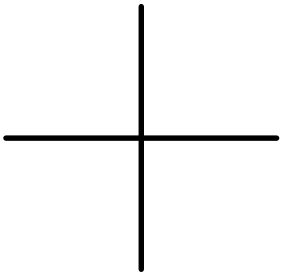
$sin\frac{\pi}{3} =$



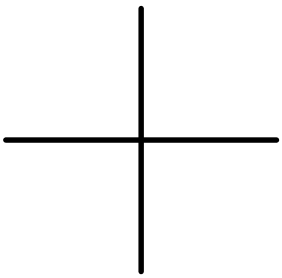
$tan\frac{5\pi}{4} =$



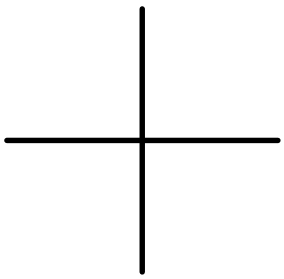
$sin\frac{11\pi}{6} =$



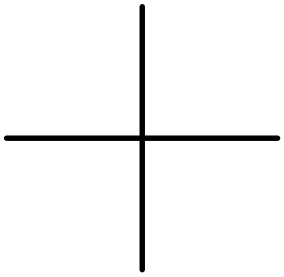
$sin\frac{4\pi}{3} =$



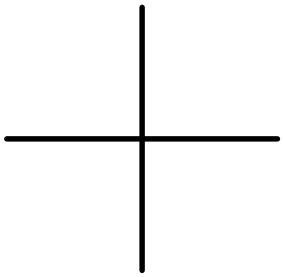
$cos\frac{\pi}{6} =$



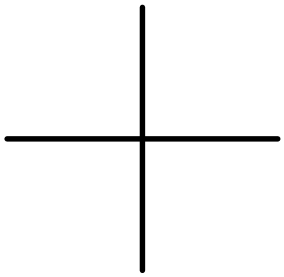
$tan\frac{\pi}{4} =$



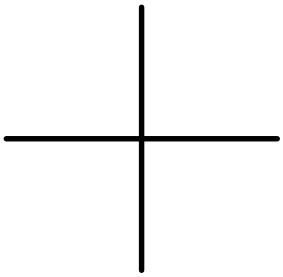
$tan\frac{7\pi}{4} =$



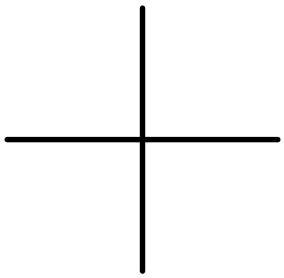
$sin\frac{5\pi}{6} =$



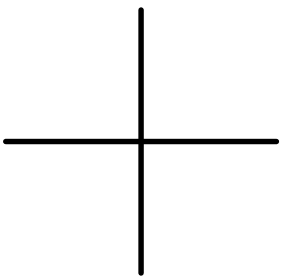
$cos\frac{3\pi}{4} =$



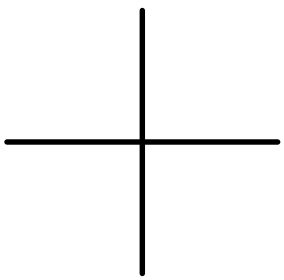
$sin\frac{5\pi}{3} =$



$tan\frac{7\pi}{6} =$



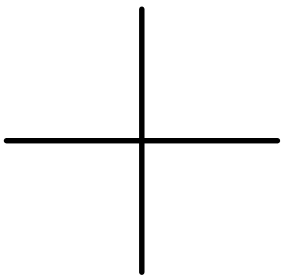
$sin\frac{2\pi}{3} =$



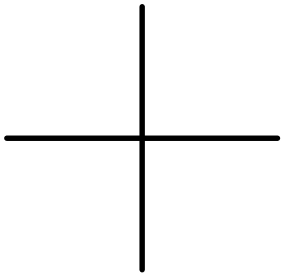
C12 - 4.3 - Solve sinx=$\frac{1}{2}$ HW

Solve for $x, 0 \le x < 2\pi$, *answer should say* $x =$

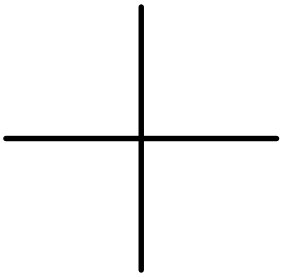
$sinx = \frac{1}{2}$



$cosx = -\frac{1}{\sqrt{2}}$

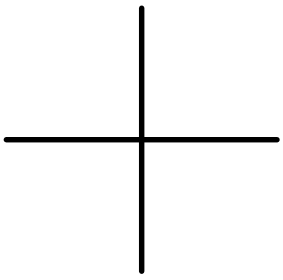


$tanx = -1$

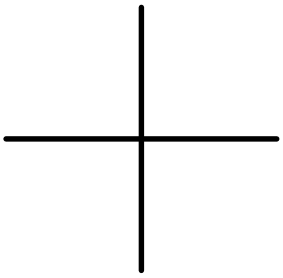


*rationalize

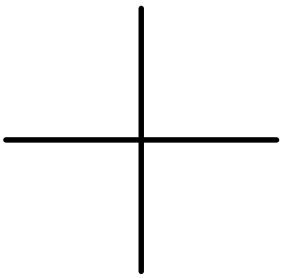
$sinx = \frac{\sqrt{3}}{2}$



$cosx = \frac{\sqrt{2}}{2}$



$sinx = -\frac{1}{2}$



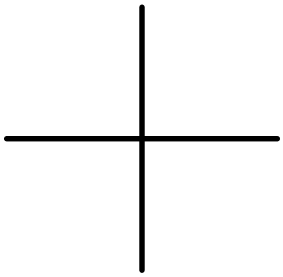
$cosx = \frac{1}{2}$ $sinx = -\frac{1}{\sqrt{2}}$ $tanx = -\frac{1}{\sqrt{3}}$ $cosx = -2$ $tanx = \sqrt{3}$ $tanx = \frac{1}{\sqrt{3}}$

$cosx = -\frac{\sqrt{3}}{2}$ $tanx = 1$ $sinx = -\frac{\sqrt{3}}{2}$ $tanx = -\sqrt{3}$ $sinx = \frac{1}{\sqrt{2}}$ $cosx = \frac{\sqrt{3}}{2}$

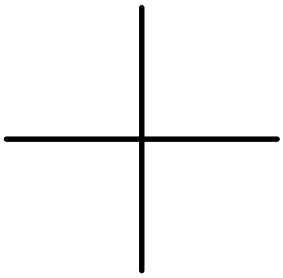
C12 - 4.3 - $sin\theta = 0.8$ HW

Solve for $x, 0 \leq x < 2\pi$, *answer should say* $x =$

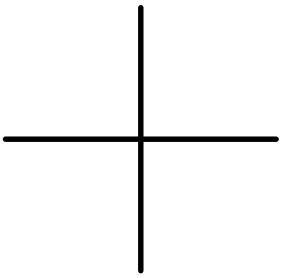
$tanx = -2$



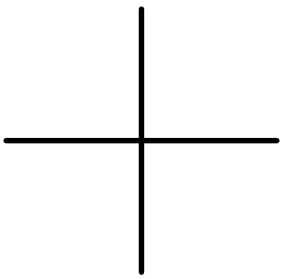
$sinx = 0.6$



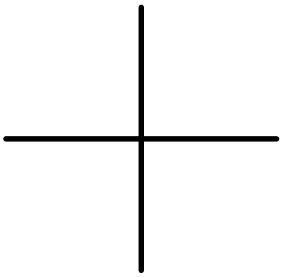
$cosx = \frac{1}{4}$



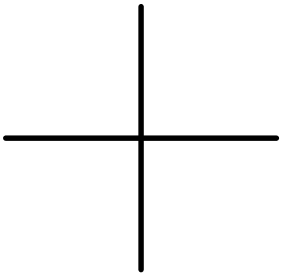
$sinx = -0.4$



$tanx = \frac{1}{5}$



$cosx = 2$



$sinx = -0.1$ $\quad tanx = \frac{4}{5}$ $\quad sinx = -0.8$ $\quad cosx = -\frac{1}{5}$ $\quad tanx = -0.707$ $\quad sinx = \frac{1}{3}$

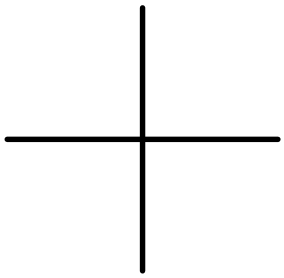
$cosx = -0.5$ $\quad cosx = 0.75$ $\quad tanx = -0.866$ $\quad cosx = -0.65$ $\quad sinx = -\frac{2}{3}$ $\quad tanx = 0.35$

C12 - 4.3 - Point Trig Ratio HW

SOH CAH TOA

Find all 6 trig functions for the following points. And Find the Reference Angle and Angle in Standard Position.

(4,3)



$\theta_r =$

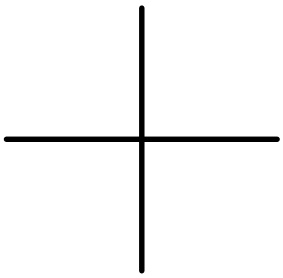
$\theta_{stp} =$

$sinx =$ $cscx =$

$cosx =$ $secx =$

$tanx =$ $cotx =$

$(-3,4)$



$\theta_r =$

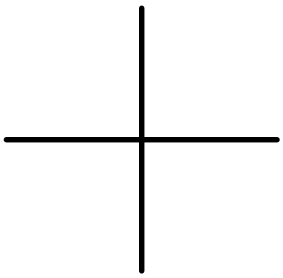
$\theta_{stp} =$

$sinx =$ $cscx =$

$cosx =$ $secx =$

$tanx =$ $cotx =$

(2,3)



$\theta_r =$

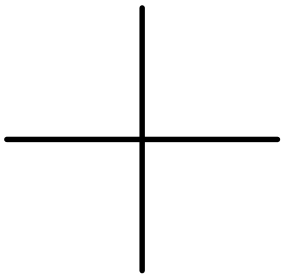
$\theta_{stp} =$

$sinx =$ $cscx =$

$cosx =$ $secx =$

$tanx =$ $cotx =$

$(5,-6)$



$\theta_r =$

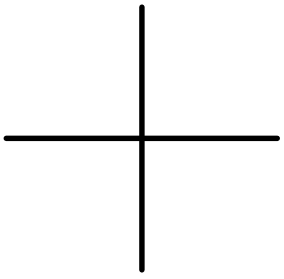
$\theta_{stp} =$

$sinx =$ $cscx =$

$cosx =$ $secx =$

$tanx =$ $cotx =$

$(-5,12)$



$\theta_r =$

$\theta_{stp} =$

$sinx =$ $cscx =$

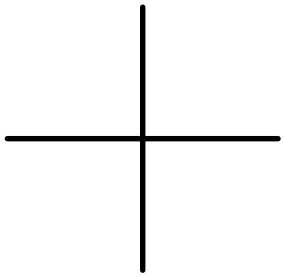
$cosx =$ $secx =$

$tanx =$ $cotx =$

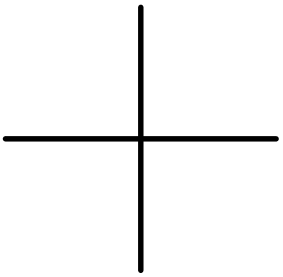
C12 - 4.3 - Solve $csc\theta, sec\theta, cot\theta = ?$ *HMK*

Solve

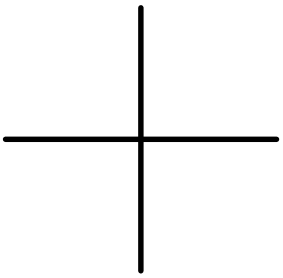
$cot\frac{\pi}{3} =$



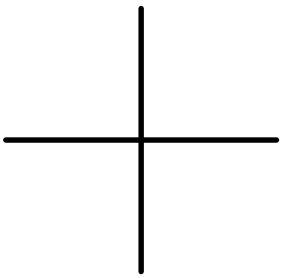
$sec\frac{5\pi}{4} =$



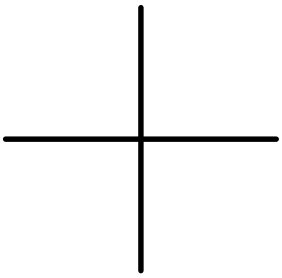
$sec\frac{11\pi}{6} =$



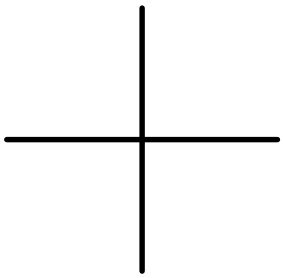
$sec\frac{4\pi}{3} =$



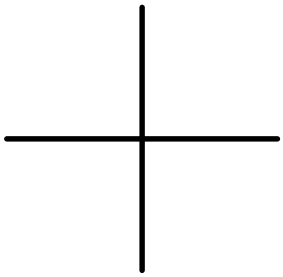
$csc\frac{\pi}{6} =$



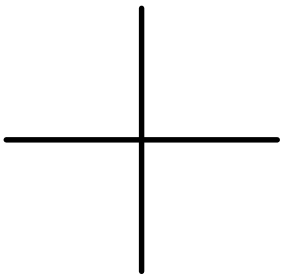
$cot\frac{5\pi}{6} =$



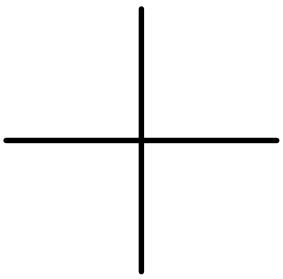
$csc\frac{7\pi}{4} =$



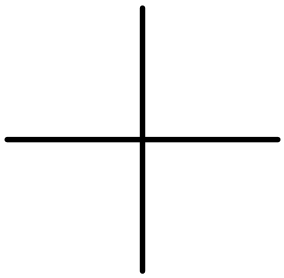
$cot\frac{\pi}{4} =$



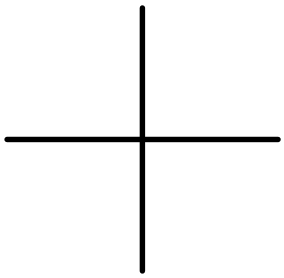
$sec\frac{3\pi}{4} =$



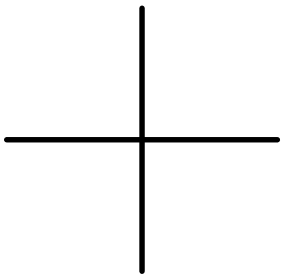
$sec\frac{5\pi}{3} =$



$csc\frac{7\pi}{6} =$



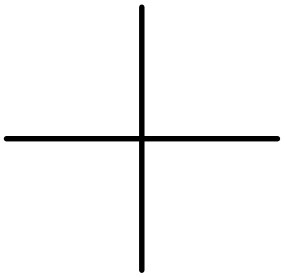
$cot\frac{2\pi}{3} =$



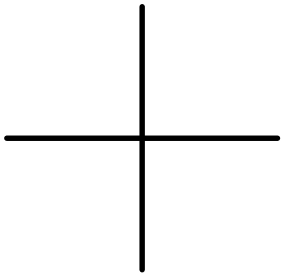
C12 - 4.3 - Solve cscx=2 HW

Solve for $x, 0 \le x < 2\pi$, *answer should say* $x =$

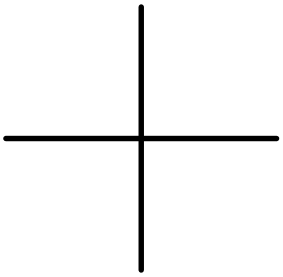
$secx = 2$



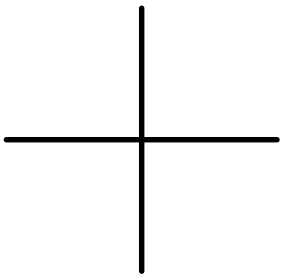
$cscx = -\frac{1}{\sqrt{2}}$



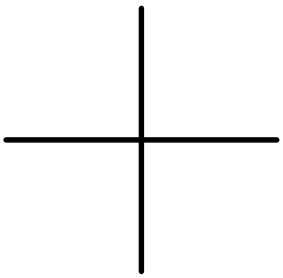
$cotx = -1$



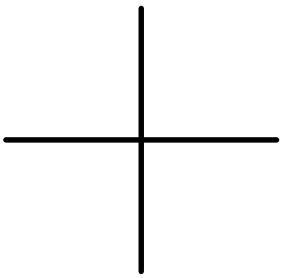
$cscx = \frac{\sqrt{3}}{2}$



$cotx = \sqrt{3}$



$secx = -\sqrt{2}$



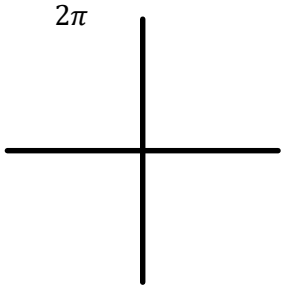
$cscx = 2$ $\quad$ $secx = -2$ $\quad$ $cotx = -\frac{1}{\sqrt{3}}$ $\quad$ $cscx = -2$ $\quad$ $cotx = -\sqrt{3}$

$sinx = -\frac{\sqrt{3}}{2}$ $\quad$ $cotx = 1$ $\quad$ $secx = -\frac{\sqrt{3}}{2}$ $\quad$ $secx = \frac{1}{\sqrt{2}}$ $\quad$ $cscx = \frac{\sqrt{3}}{2}$

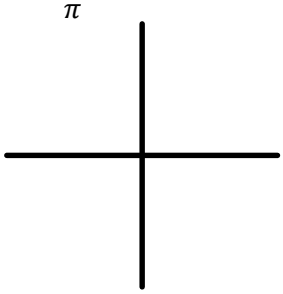
C11 - 4.4 - Unit Circle Quadrantal Angle HW

Sketch θ_{stp}, Label the point on the unit circle.

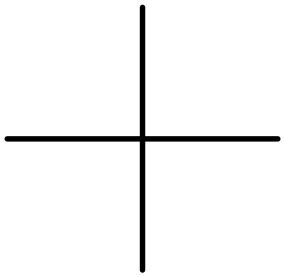
2π



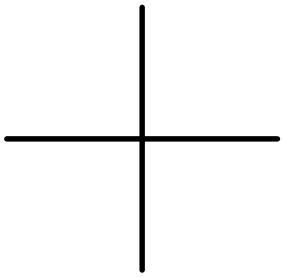
π



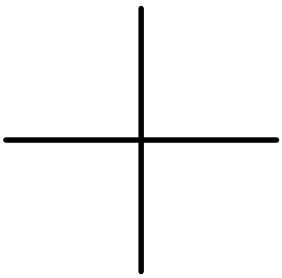
$\frac{3\pi}{2}$



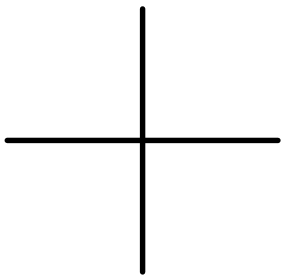
$\frac{\pi}{2}$



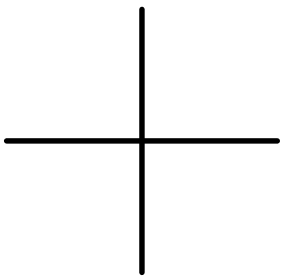
4.71



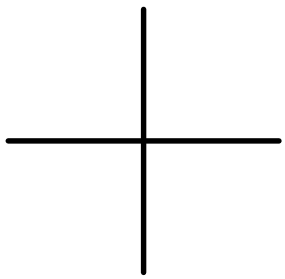
1.57



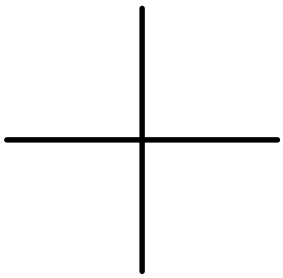
6.28



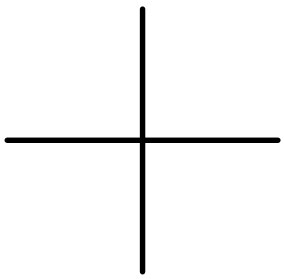
3.14



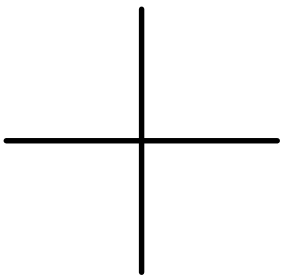
$\frac{3\pi}{2}$



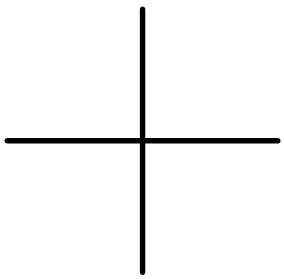
$\frac{\pi}{2}$



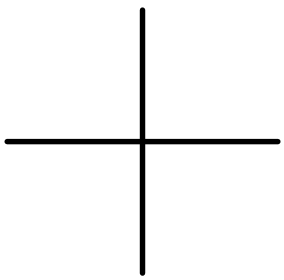
π



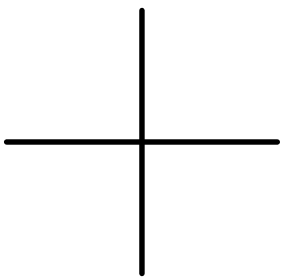
2π



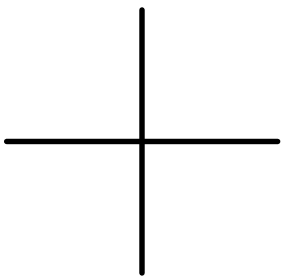
4.71



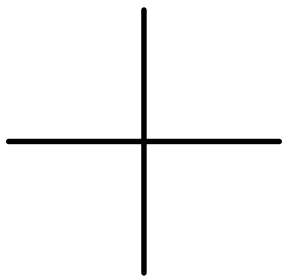
1.57



6.28



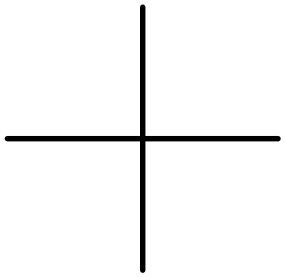
3.14



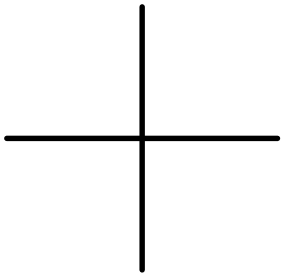
C12 - 4.4 - Solve $sin\theta = ?$ *HW*

Solve.

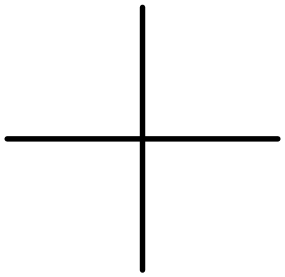
$sin2\pi =$



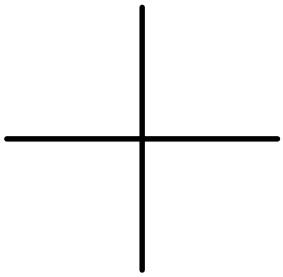
$cos\pi =$



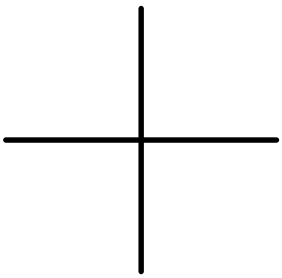
$tan\frac{3\pi}{2} =$



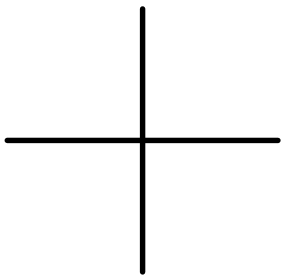
$sin\frac{\pi}{2} =$



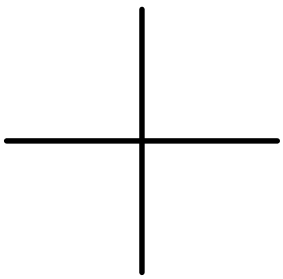
$cos4.71 =$



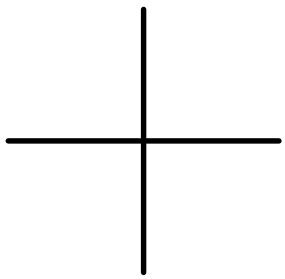
$csc1.57 =$



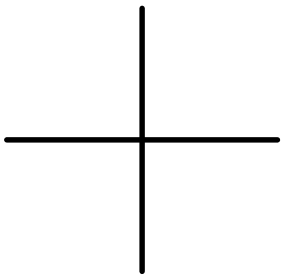
$tan6.28 =$



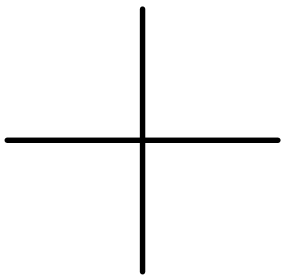
$sec3.14 =$



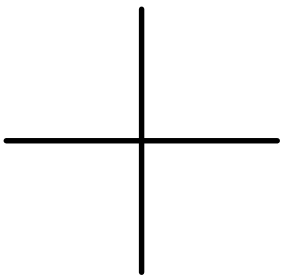
$csc\frac{3\pi}{2} =$



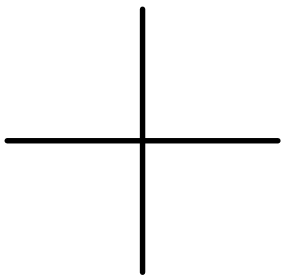
$cos\frac{\pi}{2} =$



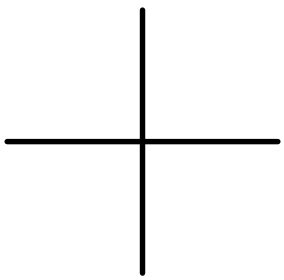
$cot\pi =$



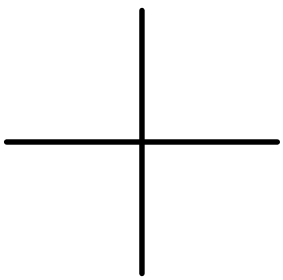
$cos2\pi =$



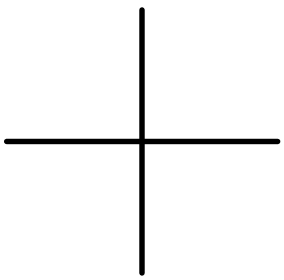
$sin4.71 =$



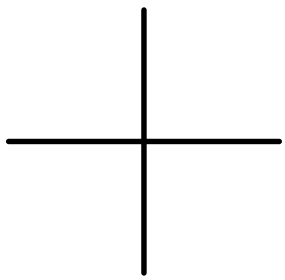
$cos1.57 =$



$tan6.28 =$



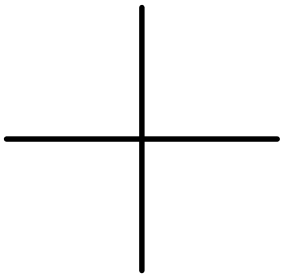
$cot3.14 =$



C12 - 4.4 - Point on Unit Circle HW

Find sinx, cox, and tanx for the following points and θ stp.

(0,1)



$sin\theta =$

$cos\theta =$

$tan\theta =$

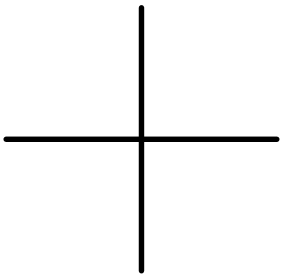
$csc\theta =$

$sec\theta =$

$cot\theta =$

$\theta_{stp} =$

(1,0)



$sin\theta =$

$cos\theta =$

$tan\theta =$

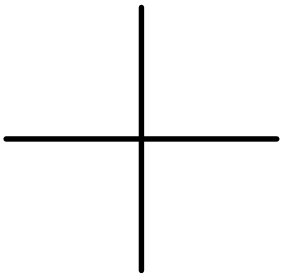
$csc\theta =$

$sec\theta =$

$cot\theta =$

$\theta_{stp} =$

$(0, -1)$



$sin\theta =$

$cos\theta =$

$tan\theta =$

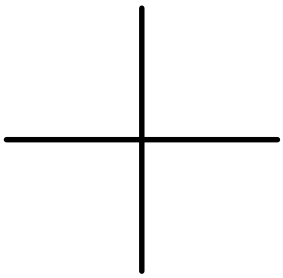
$csc\theta =$

$sec\theta =$

$cot\theta =$

$\theta_{stp} =$

$(-1,0)$



$sin\theta =$

$cos\theta =$

$tan\theta =$

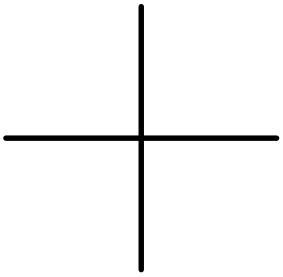
$csc\theta =$

$sec\theta =$

$cot\theta =$

$\theta_{stp} =$

(0,3)



$sin\theta =$

$cos\theta =$

$tan\theta =$

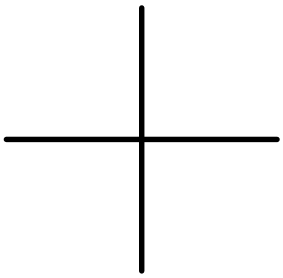
$csc\theta =$

$sec\theta =$

$cot\theta =$

$\theta_{stp} =$

$(-99,0)$



$sin\theta =$

$cos\theta =$

$tan\theta =$

$csc\theta =$

$sec\theta =$

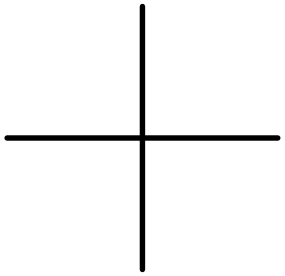
$cot\theta =$

$\theta_{stp} =$

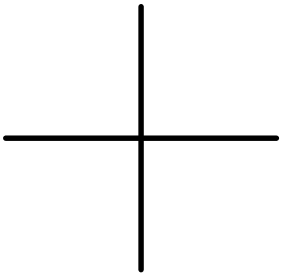
C12 - 4.4 - Unit Circle Trig Equations HW

Solve for $\theta, 0 \leq \theta < 2\pi$

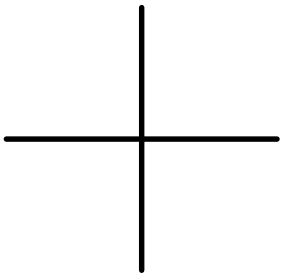
$sin\theta = 1$



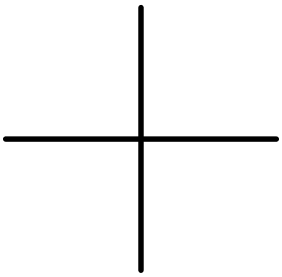
$cos\theta = 0$



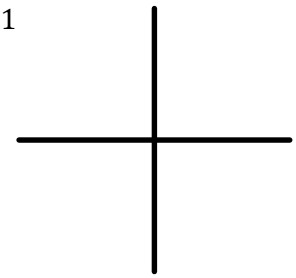
$csc\theta = 1$



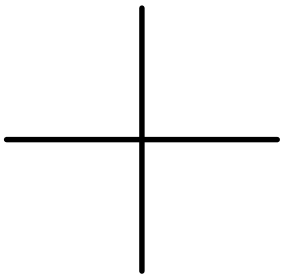
$cos\theta = -1$



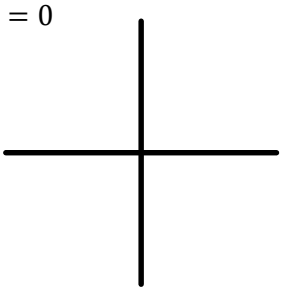
$sin\theta = -1$



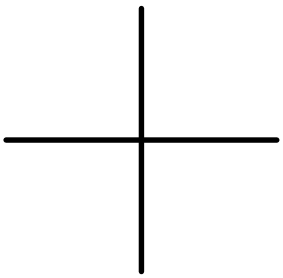
$cot\theta = und$



$\sin^2\theta - 1 = 0$



$sec\theta = 0$



C12 - 4.5 - $sin2\theta = \frac{1}{2}$ *ASTC Special Unit Decimal HW* $0 \leq \theta < 2\pi$

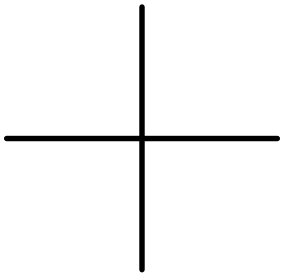
$\cos\left(\frac{1}{2}x\right) = 0$ $tan2\theta = 1$ $sin2\theta = -0.4$

$\cos(2\theta) = 1$ $\sin\left(\frac{1}{2}\theta\right) = \frac{1}{2}$ $tan4\theta = 0.6$

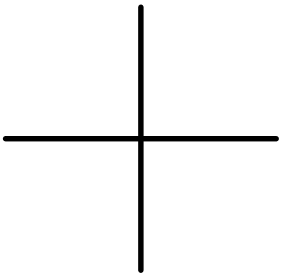
$tan2\theta = 1$ $\cos\left(\frac{1}{2}\theta\right) = -\frac{1}{\sqrt{2}}$ $sin3\theta = 0.6$ $sin2\theta = \theta$

C12 - 4.5 - Algebra Special Trig Decimal Equations HW

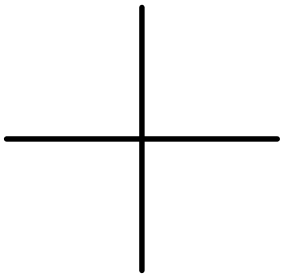
$Solve\ for\ x, 0 \leq x < 2\pi$



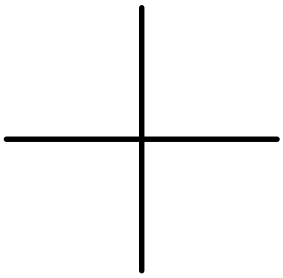
$2sinx = 1$



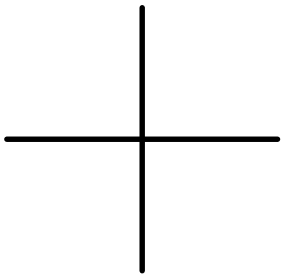
$\sqrt{2}cosx - 3 = -2$



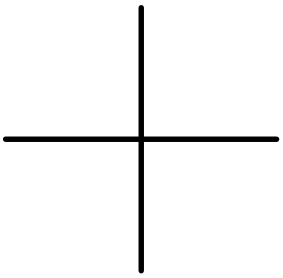
$-2sinx + 1 = 5$



$4\cos^2 x - 1 = 0$



$sinx - cosx = 0$



$-2\sin^2 x + 32 = 0$

$2tanx = 2$

$2cosx + 1 = 0$

$2cosx = -\sqrt{3}$

$\tan^2 x = 1$

$4\sin^2 x - 1 = 2$

$-\sqrt{2}sinx - 1 = 0$

$2\cos^2 x = 1$

$2sinx = -\sqrt{3}$

$tanx - 2 = -3$

C12 - 4.5 - Period *HW*

$0 \le \theta < 2\pi$

$\cos(x-2)=0$

$\sin(2x-2)=-\frac{1}{2}$

$tan2x = 0{,}2$

$\cos\left(\frac{\pi}{3}(x-2)\right)=\frac{1}{2}$

$\sin\left(\frac{\pi}{2}(x-1)\right)-1=1$

$\tan\left(\frac{\pi}{4}(x-6)\right)=5$

$2\cot(2\pi-1)=-3.8$

$\cos\left(\frac{\pi}{6}\left(x-\frac{\pi}{3}\right)\right)=0.2$

$2\tan\left(2\left(x-\frac{\pi}{2}\right)\right)+3=1$

$\cot(1.2x)=7$

C12 - 4.6 - Equations Algebra HW

$3sinx = 2 - sinx$

$1 - cosx = 4cosx$

$-3 + 2sinx = 7sinx - 1$

$\frac{tanx + 1}{tanx} = 2$

$2cosx = 4$

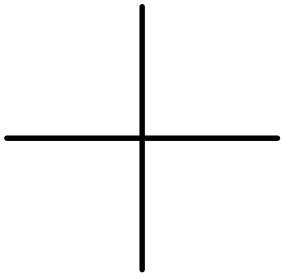
$7 - 3secx = 2$

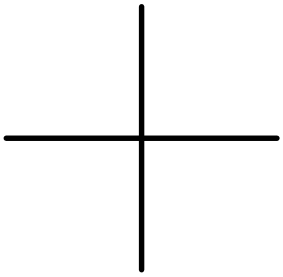
$cosx = secx$

C12 - 4.6 - Factoring Equations HW

Solve for $x, 0 \le x < 2\pi$, by factoring, then setting factors equal to zero and solve.

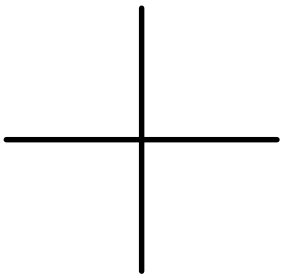
$\sin^2 x - sinx = 0$

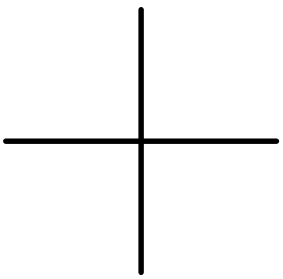




0,1

$2\sin^2 x + sinx - 1 = 0$





$\frac{1}{2}, -1$

$\cos^2 x - cosx - 2 = 0$

$\sin^2 x + sinx - 2 = 0$

$2\cos^2 x - cosx - 1 = 0$

$\cos^2 x + cosx = 0$

$2\cos^2 x - 6cosx - 7 = 0$

$3\sin^2 x + 5sinx - 2 = 0$

$cosx + 1 - 2secx = 0$

$tanx = 2cotx - 1$

$2sinx = 3\tan^2 x$
Polynomial!

C12 - 4.7 - NPVs WS

$Denominator \neq 0$

Determine the non-permissible values of x in radians, for the following expressions.

$\boldsymbol{\frac{1}{sinx}}$

$\boldsymbol{\frac{sinx}{cosx}}$

$\boldsymbol{\frac{cosx}{1-sinx}}$

$\boldsymbol{cscx}$

$\frac{tanx}{sinx}$

$\frac{1}{cscx}$

$\frac{1}{cos\theta - \frac{1}{2}}$

$\frac{1}{tanx}$

$\frac{cscx}{tanx}$

$\frac{cotx}{tanx}$

$\frac{tanx}{x}$

$\frac{1}{\cos^2 x}$

$\frac{1}{1-\sin^2 x}$

$\frac{1}{tan\theta - 1}$

$\frac{1}{sin\theta - \frac{1}{\sqrt{2}}}$

$\boldsymbol{\frac{cosx}{5}}$

$\boldsymbol{\frac{1}{sinx - cosx}}$

$\boldsymbol{\frac{1}{sinx - tanx}}$

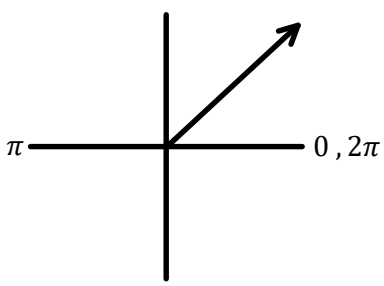
$\frac{1}{\cos^2 x + 1}$

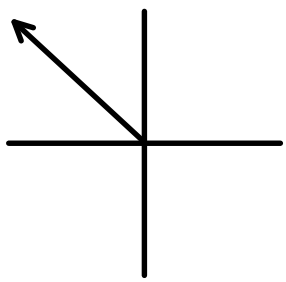
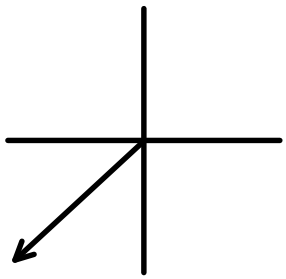
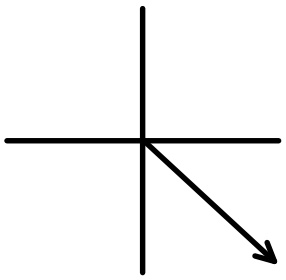
$\frac{1}{\cos^2 x + cosx - 2}$

C12 - 4.7 - Domain Change HMK

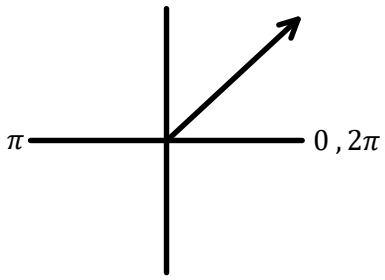
Draw θ_{stp} Arrows within the Domain

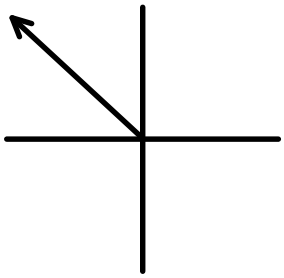
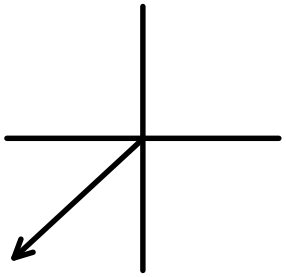
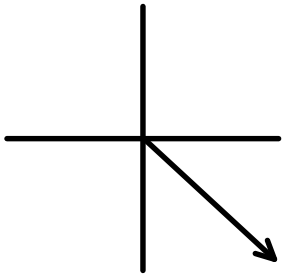
$0 \leq \theta < 2\pi$



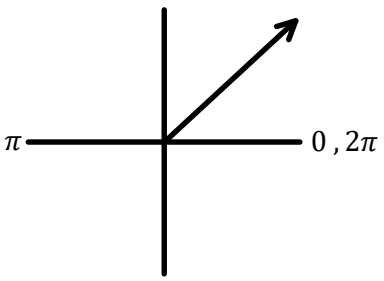




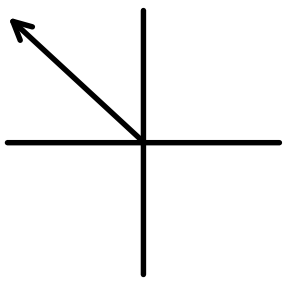
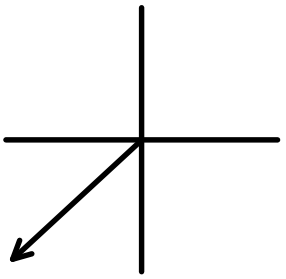
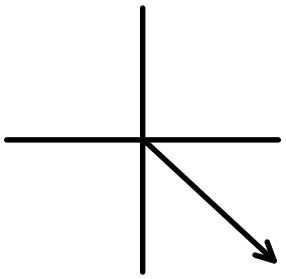
$-\pi \leq \theta < 0$



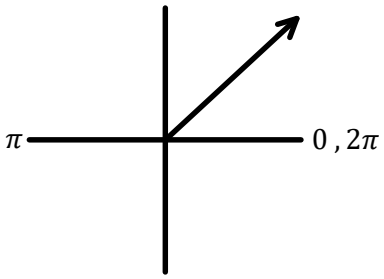




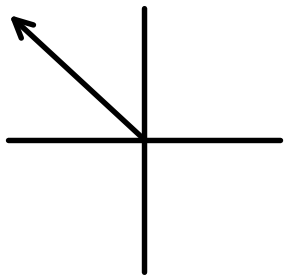
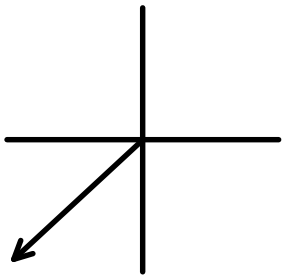
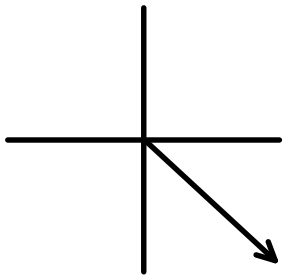
$-\frac{\pi}{2} \leq \theta < \frac{\pi}{2}$



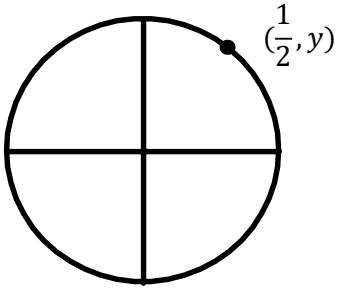
$0 \leq \theta < 4\pi$

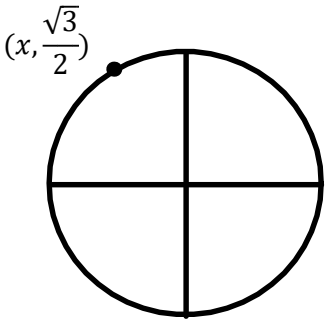


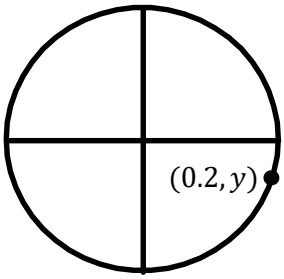




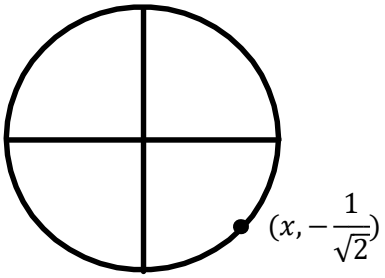
C12 - 4.8 - Solve (x,y) Unit Circle HMK

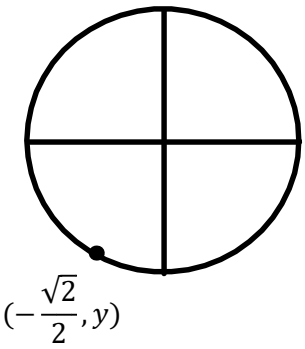
Find the missing value of the point on the unit circle

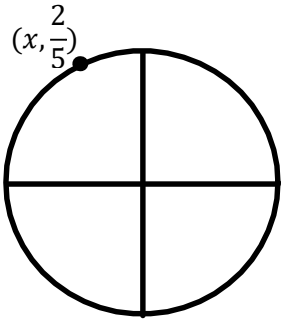






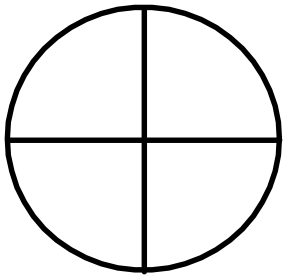




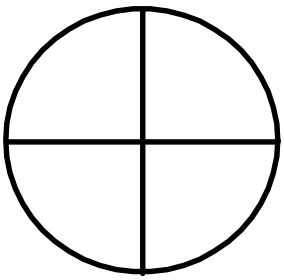


C12 - 4.8 - P(θ) = ? Solve (x,y) Unit Circle HMK

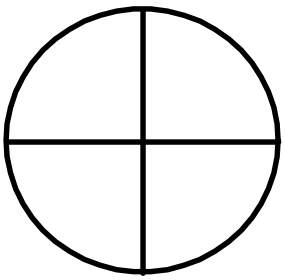
Solve the point on the unit circle



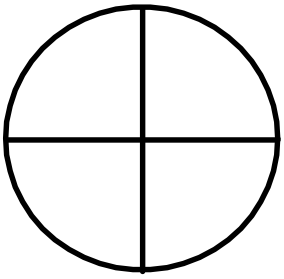
$p\left(\frac{\pi}{3}\right) =$



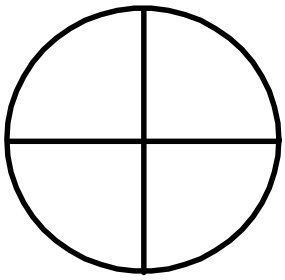
$p\left(\frac{\pi}{6}\right) =$



$p\left(\frac{\pi}{4}\right) =$



$p\left(\frac{4\pi}{3}\right) =$



$p\left(\frac{5\pi}{6}\right) =$

C12 - 4.9 - Arc Length, Central Angle HW

Don't forget to draw and label the circle!

What is the arc length of a circle with:

A radius of 1 and an angle of 45^0?

A radius of 5 and an angle of 60^0?

A radius of 4 and an angle of 180^0?

What is the arc length of a circle with:

A radius of 1 and an angle of $\frac{\pi}{4}$?

A radius of 5 and an angle of π?

A radius of 4 and an angle of $\frac{3\pi}{2}$?

What is the central in radians angle with:

A radius of 1 and an arc length of 1?

A radius of 3 and an arc length of 2?

A radius of 5 and an arc length of 12?

C12 - 4.9 - Radius, Sector Area HW

Don't forget to draw and label the circle!

What is the radius of a circle with:

An arc length of 3 and a central angle of $\frac{\pi}{3}$?

An arc length of 2 and a central angle of $\frac{\pi}{4}$?

An arc length of 5 and a central angle of π ?

What is the sector area of a circle with:

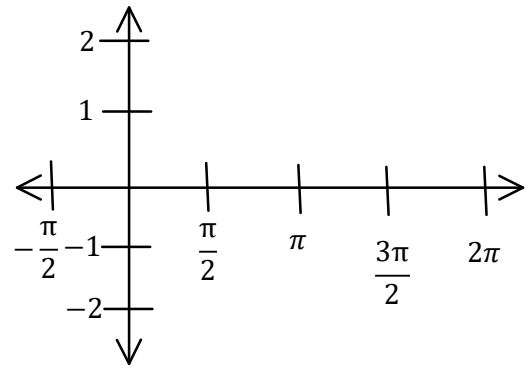
A radius of 1 and an arc length of 1?

A radius of 3 and an arc length of 2?

A radius of 5 and an arc length of 12?

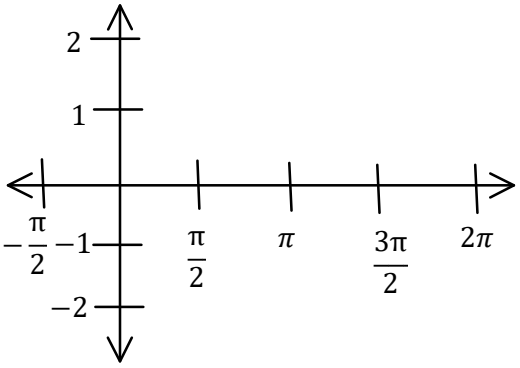
C12 - 5.1 - Sin Cos and Tan Graphs HW

Draw $y = sinx$



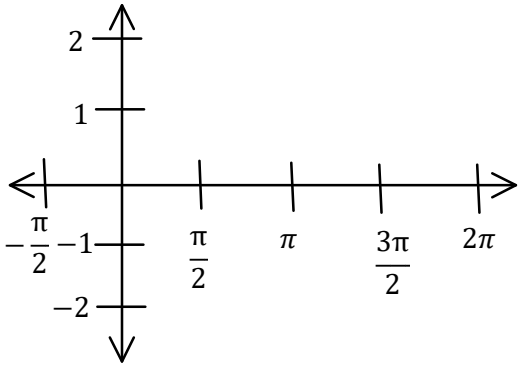
x	y
0	
$\frac{\pi}{2}$	
π	
$\frac{3\pi}{2}$	
2π	

Draw $y = cosx$



x	y
0	
$\frac{\pi}{2}$	
π	
$\frac{3\pi}{2}$	
2π	

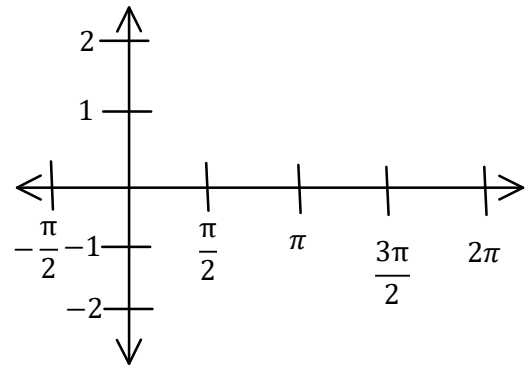
Draw $y = tanx$



x	y
0	
$\frac{\pi}{4}$	
$\frac{\pi}{2}$	
$\frac{3\pi}{4}$	
π	

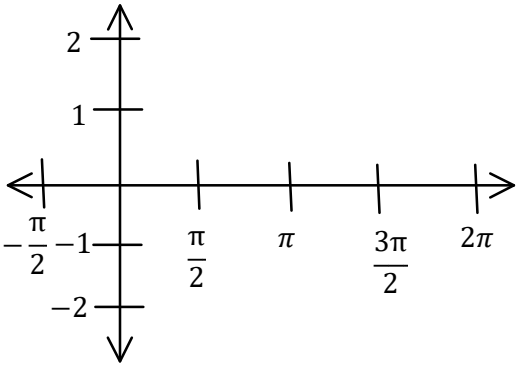
C12 - 5.1 - Sin Cos and Tan Graphs HW

Draw $y = cscx$



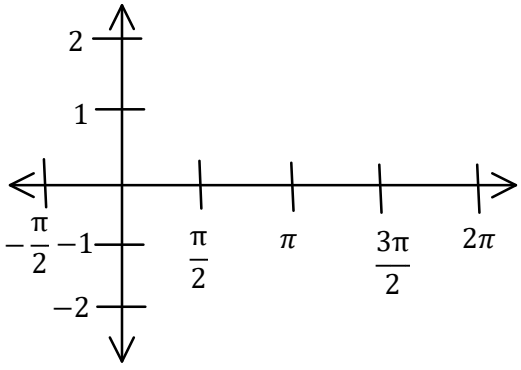
x	y
0	
$\frac{\pi}{2}$	
π	
$\frac{3\pi}{2}$	
2π	

Draw $y = secx$



x	y
0	
$\frac{\pi}{2}$	
π	
$\frac{3\pi}{2}$	
2π	

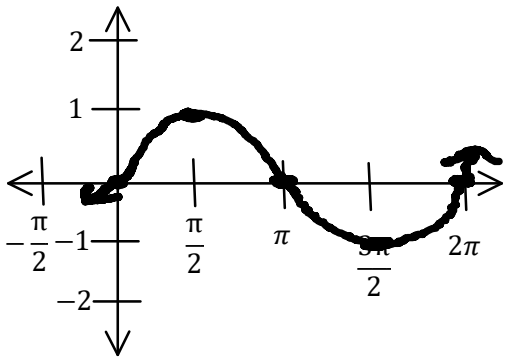
Draw $y = cotx$

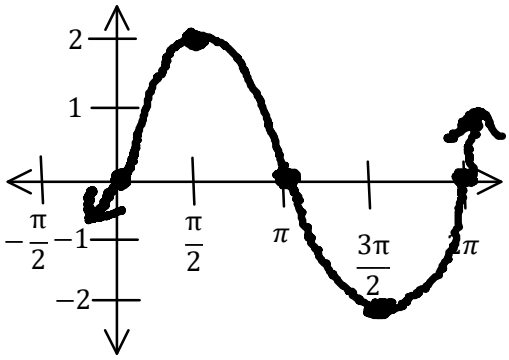


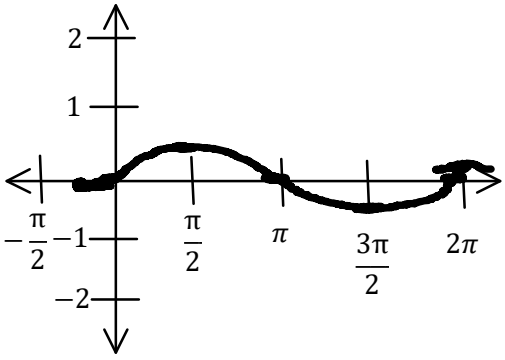
x	y
0	
$\frac{\pi}{4}$	
$\frac{\pi}{2}$	
$\frac{3\pi}{4}$	
π	

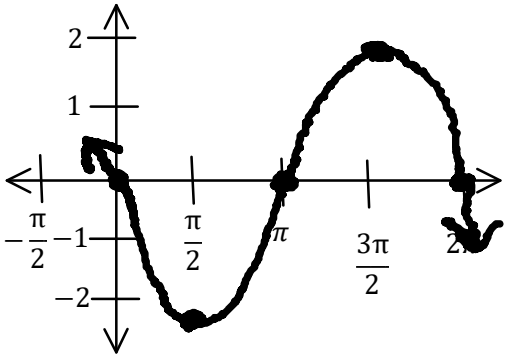
C12 - 5.2 - "a" Find Equation WS

Determine a, and the equation $y = asinx$

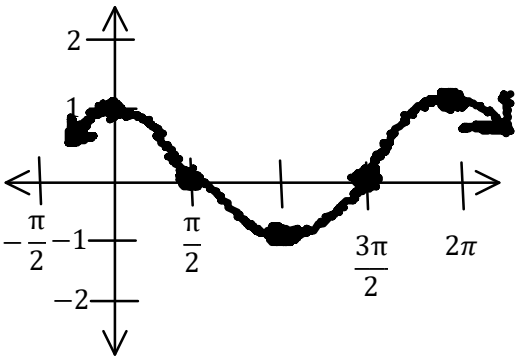


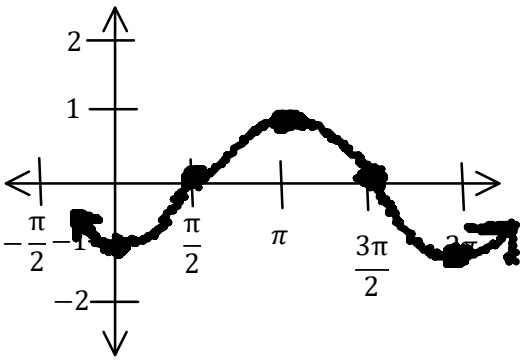


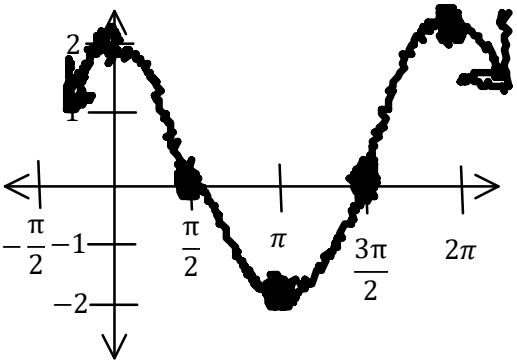


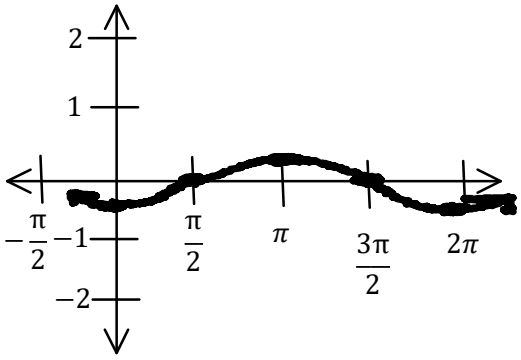


Determine a, and the equation $y = acosx$





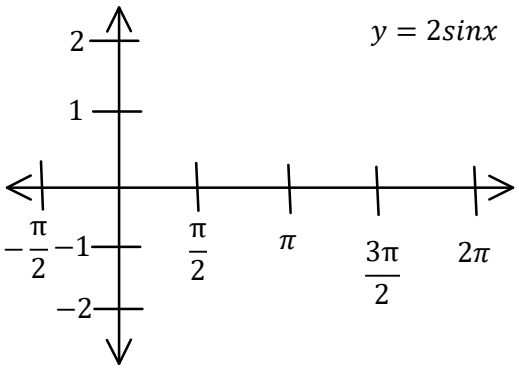




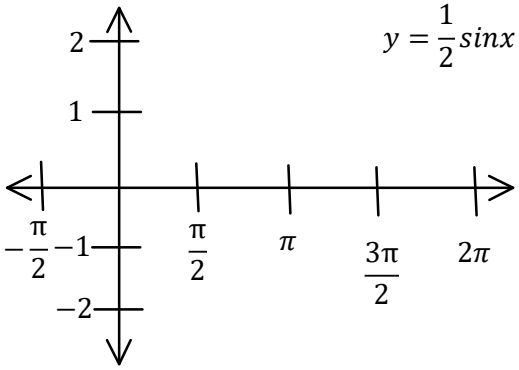
C12 - 5.2 - "a" Graphing WS

Determine a, and graph the equation $y = asinx$

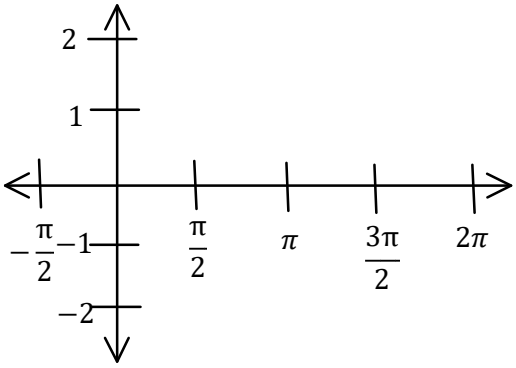
$y = 2sinx$



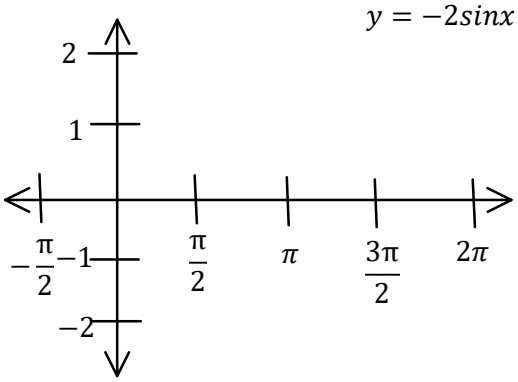
$y = \frac{1}{2}sinx$



$y = -sinx$



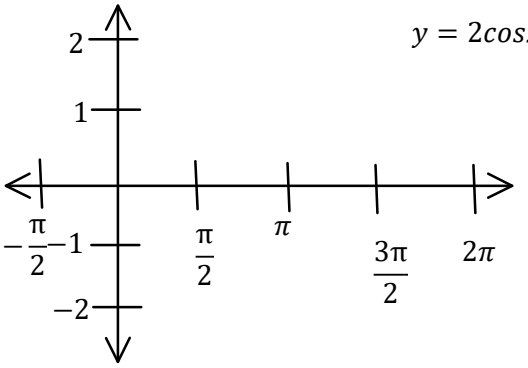
$y = -2sinx$

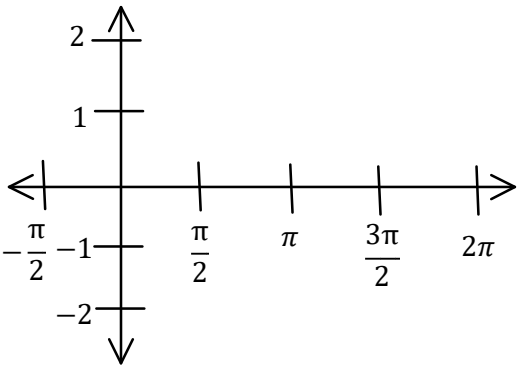


$y = \frac{1}{2}cosx$

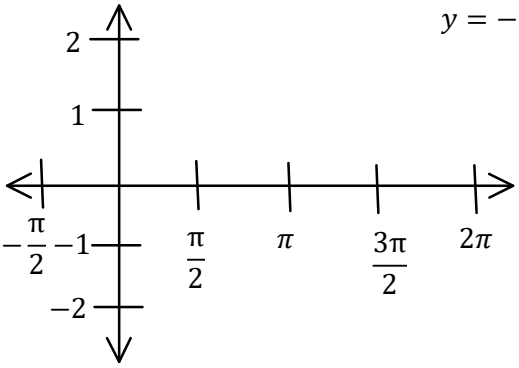
Determine a, and graph the equation $y = acosx$

$y = 2cosx$

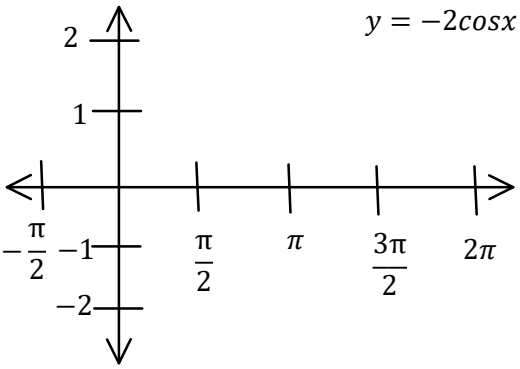




$y = -cosx$

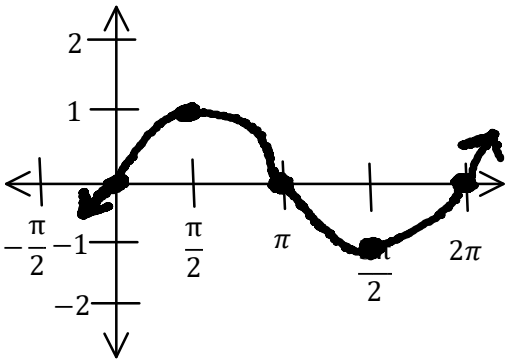


$y = -2cosx$



C12 - 5.2 - "b" Find Equation WS

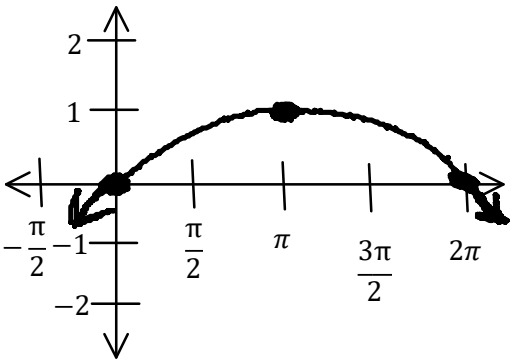
Determine b, and the equation $y = sinbx$

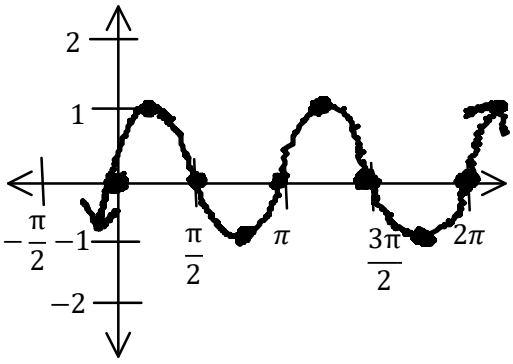


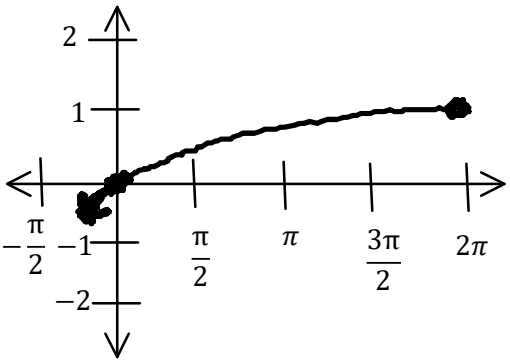
$p = \frac{2\pi}{b}$

$b = \frac{2\pi}{p}$

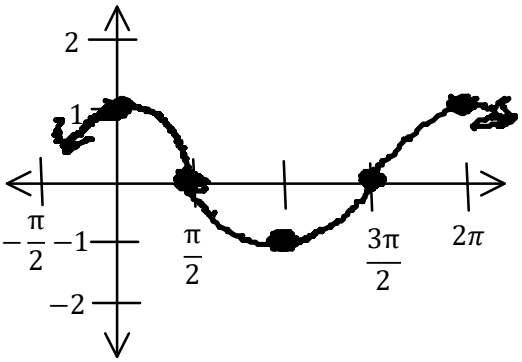
$b =$

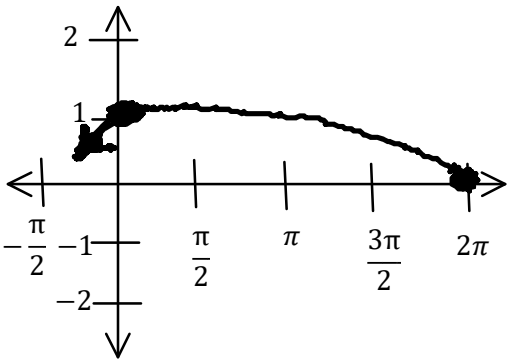


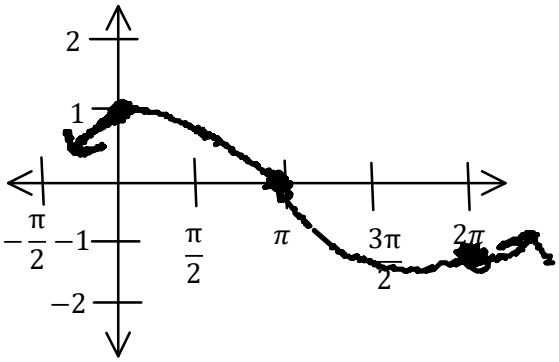


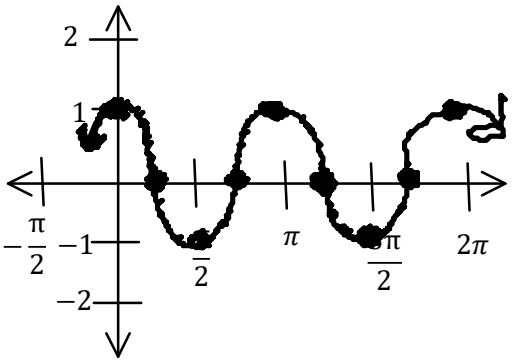


Determine b, and the equation $y = cosbx$









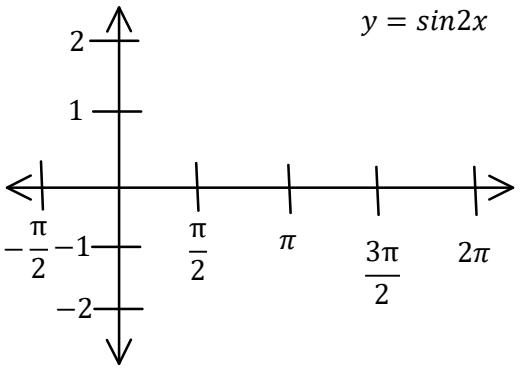
C12 - 5.2 - "b" Graphing WS

Determine b, and graph the equation $y = sinbx$

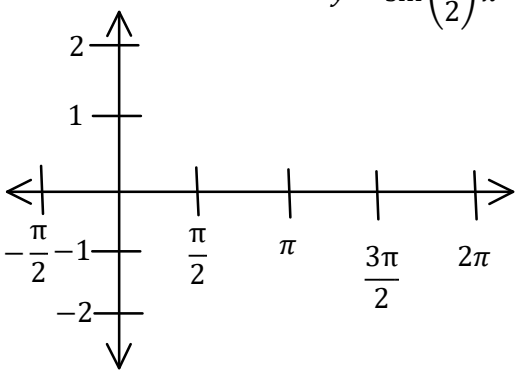
$y = sin2x$

$p = \frac{2\pi}{b}$

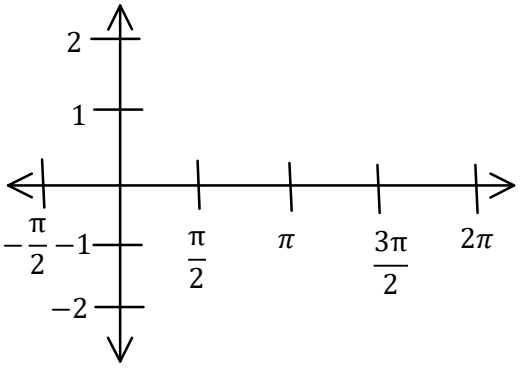
$p =$



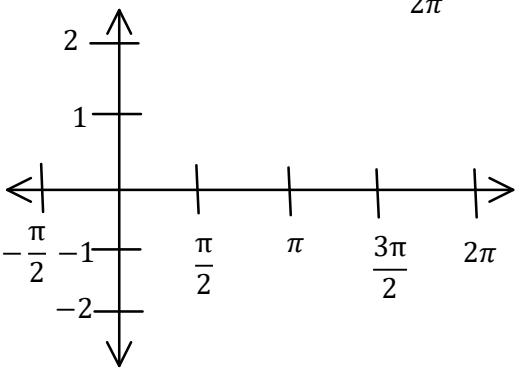
$y = \sin\left(\frac{1}{2}\right)x$



$y = sin3x$

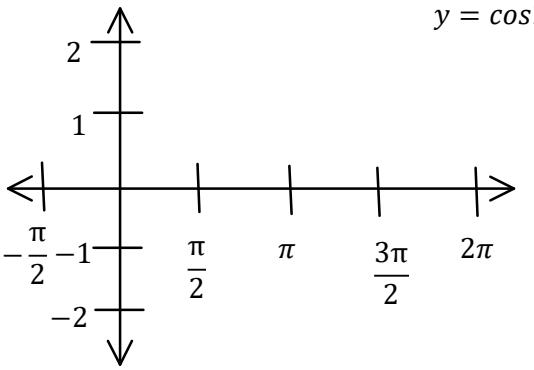


$y = \sin(\frac{1}{2\pi})x$

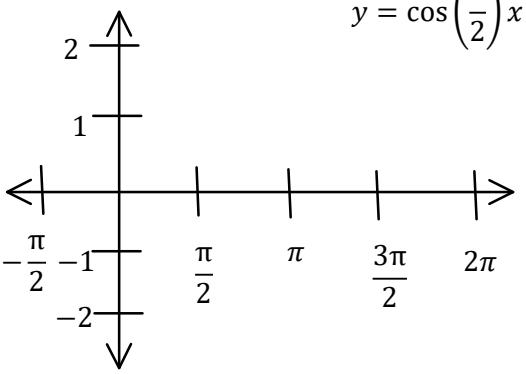


Determine b, and graph the equation $y = cosbx$

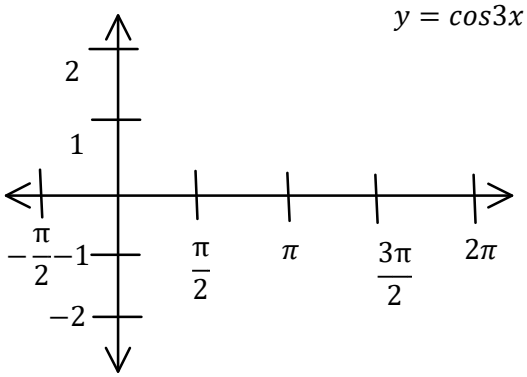
$y = cos2x$



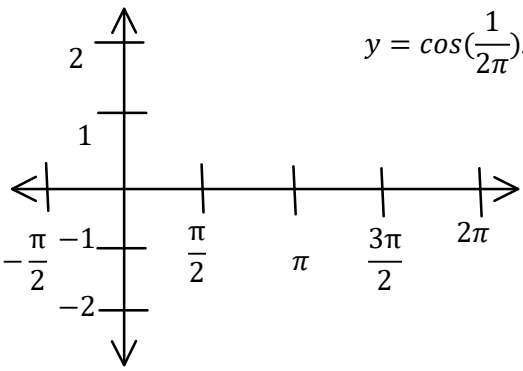
$y = \cos\left(\frac{1}{2}\right)x$



$y = cos3x$

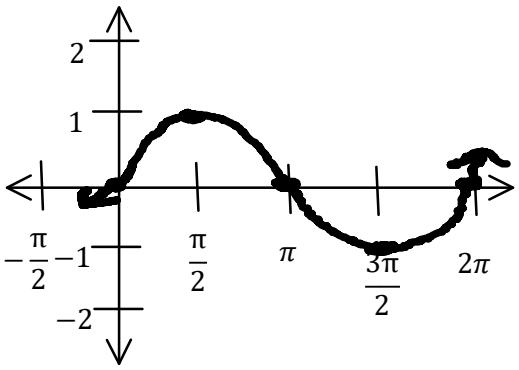


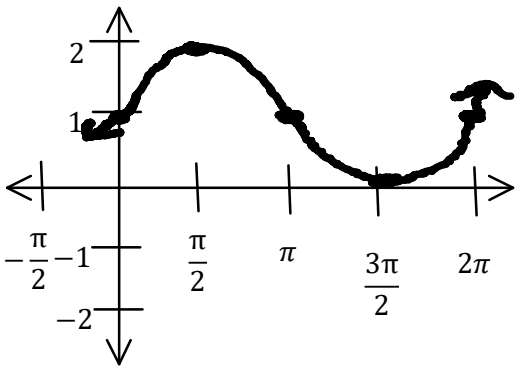
$y = cos(\frac{1}{2\pi})x$

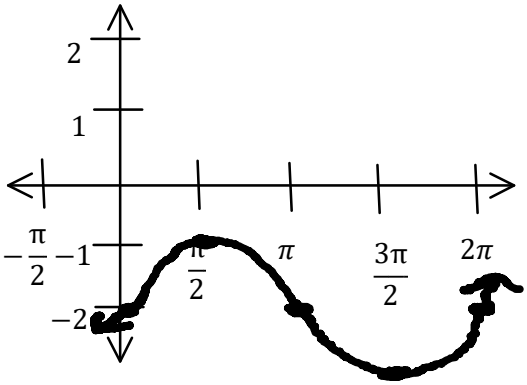


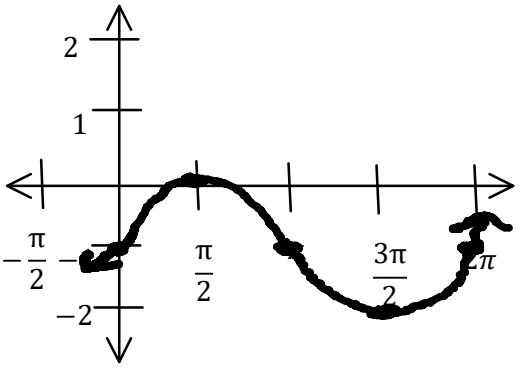
C12 - 5.3 - "d" Find Equation WS

Determine b, and the equation $y = sinx + d$

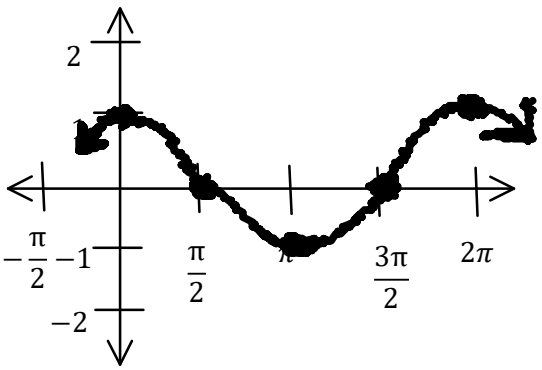


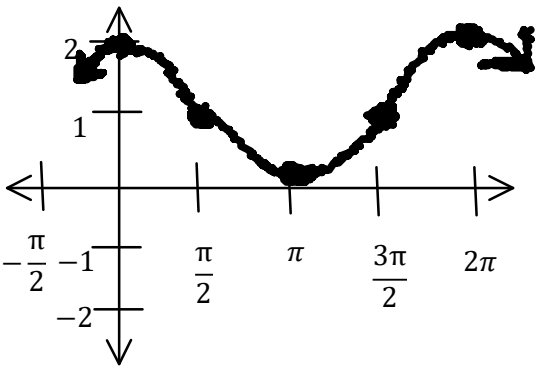


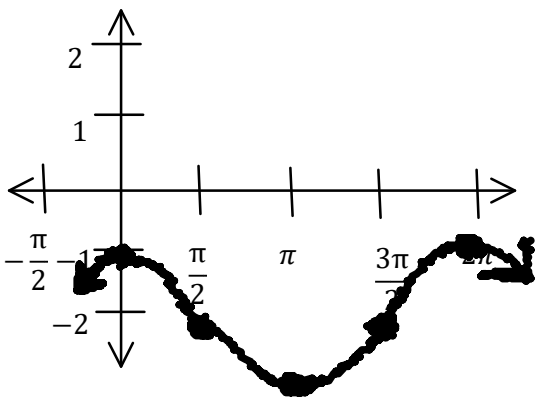


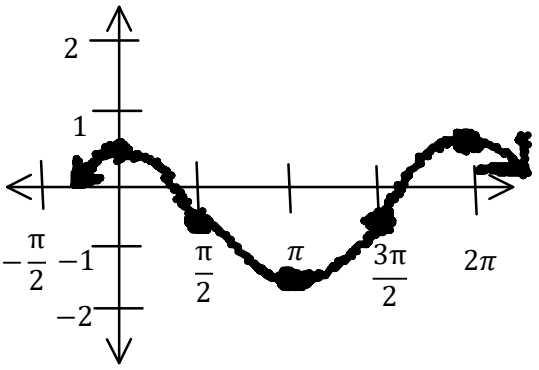


Determine b, and the equation $y = cosx + d$





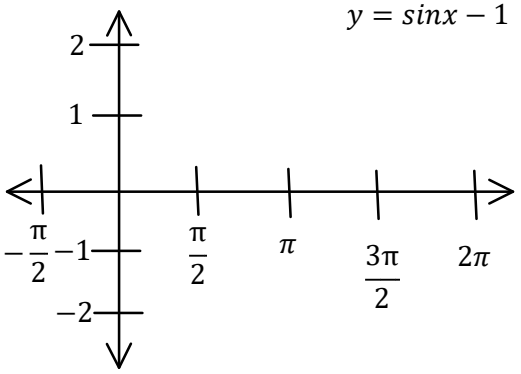




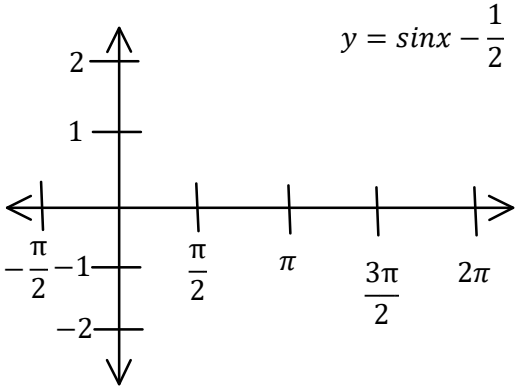
C12 - 5.3 - "d" Graphing WS

Determine b, and graph the equation $y = \boldsymbol{sinx + d}$

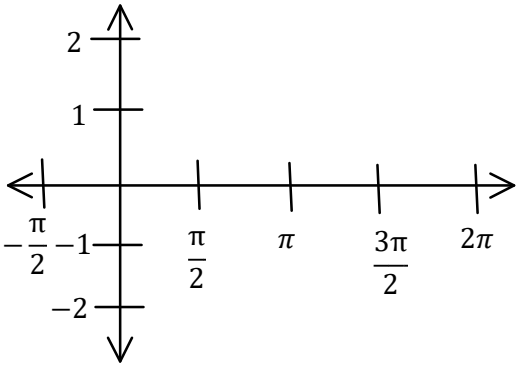
$y = sinx - 1$



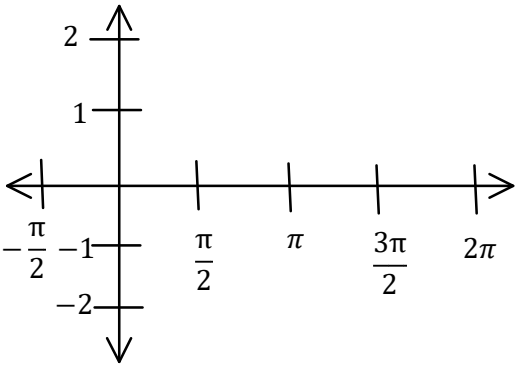
$y = sinx - \frac{1}{2}$



$y = sinx + 1$

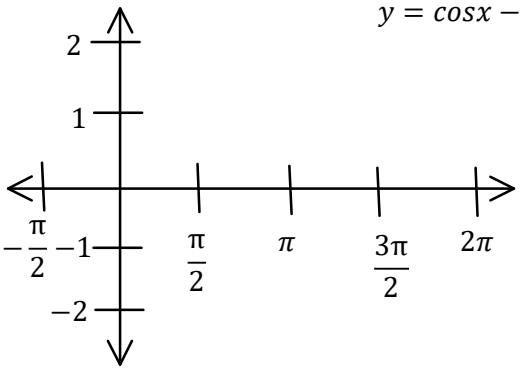


$y = sinx + 2$

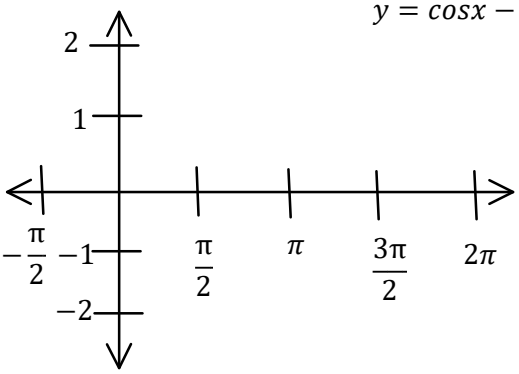


Determine b, and graph the equation $y = \boldsymbol{cosx + d}$

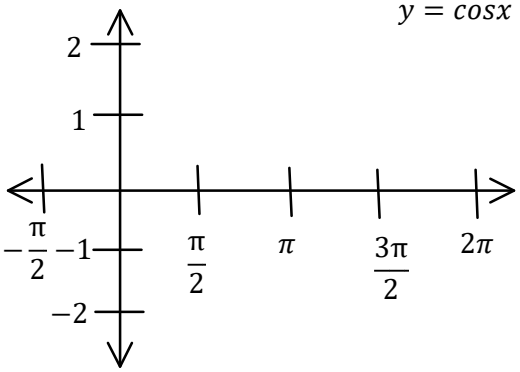
$y = cosx - 1$



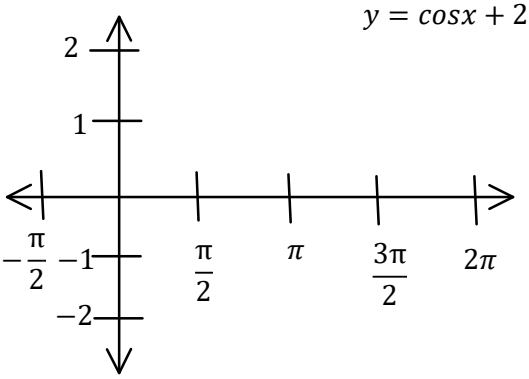
$y = cosx - \frac{1}{2}$



$y = cosx + 1$

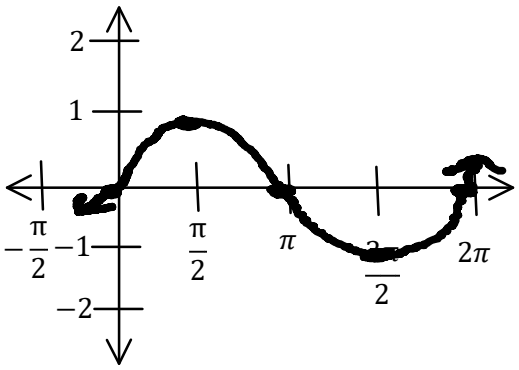


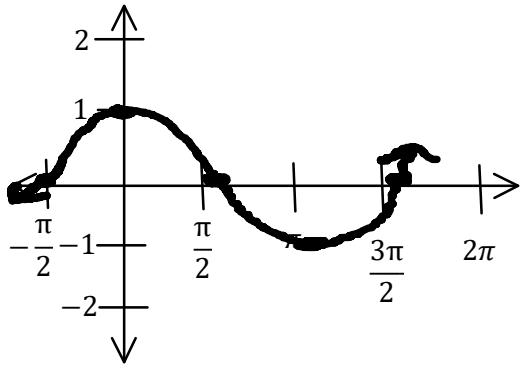
$y = cosx + 2$

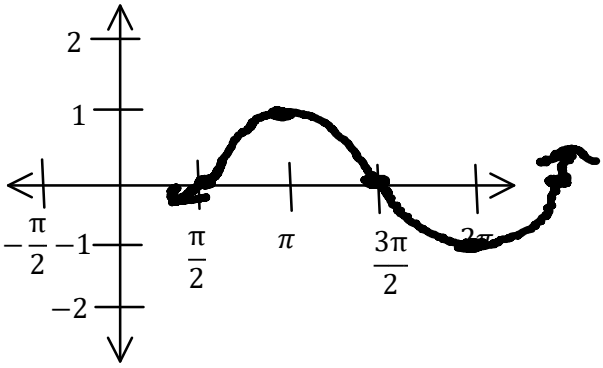


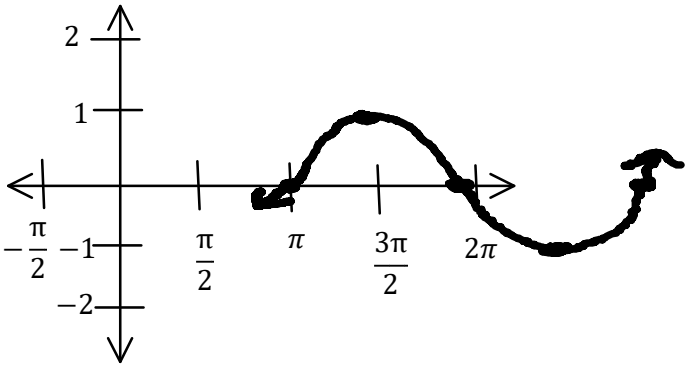
C12 - 5.3 - "c" Find Equation WS

Determine c, and graph the equation $y = sin(x \pm c)$

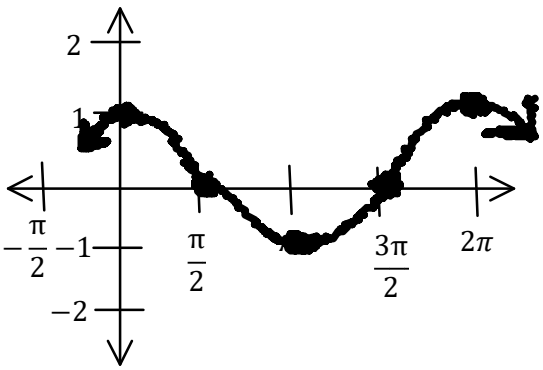


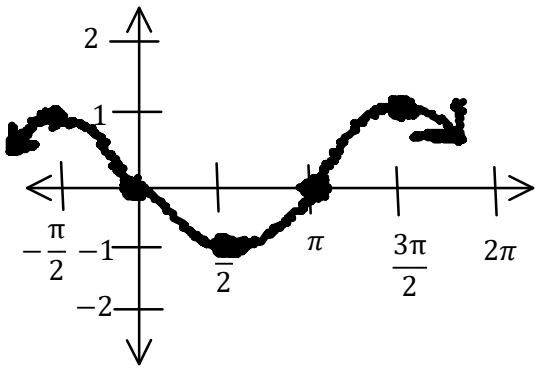


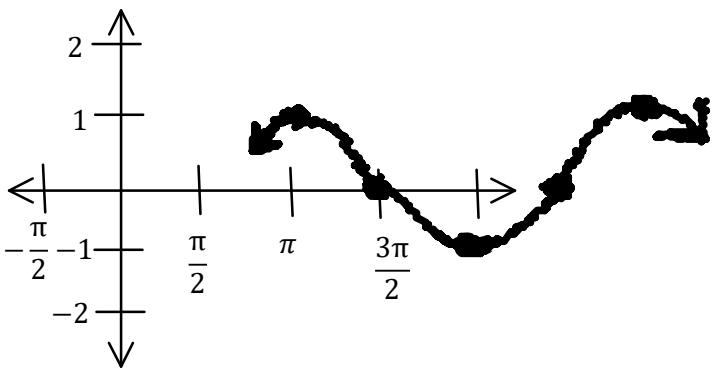


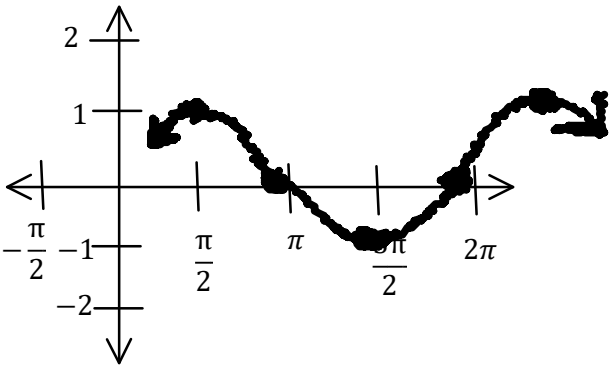


Determine b, and graph the equation $y = cos(x \pm c)$





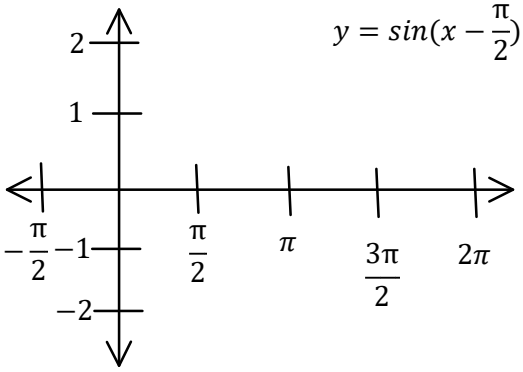




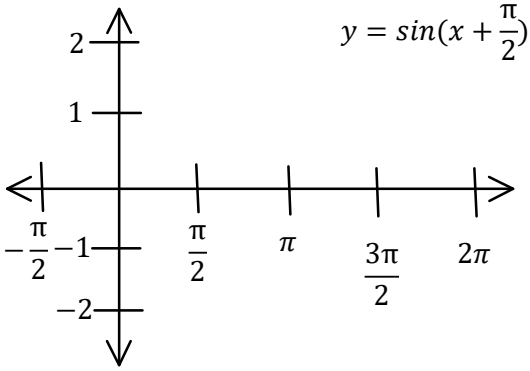
C12 - 5.3 - "c" Graphing WS

Determine c, and the equation $y = sin(x - c)$

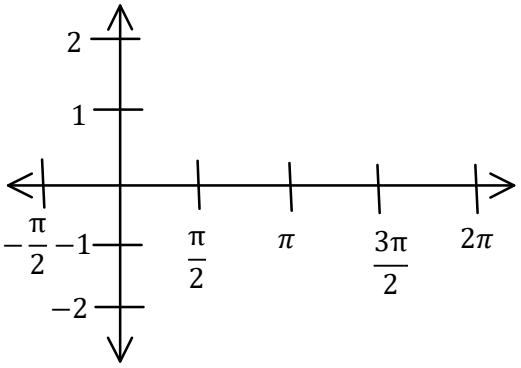
$y = sin(x - \frac{\pi}{2})$



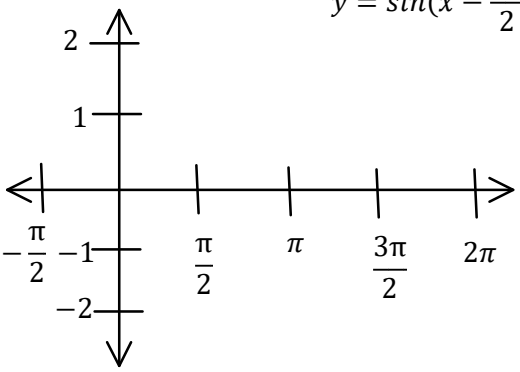
$y = sin(x + \frac{\pi}{2})$



$y = sin(x - \pi)$

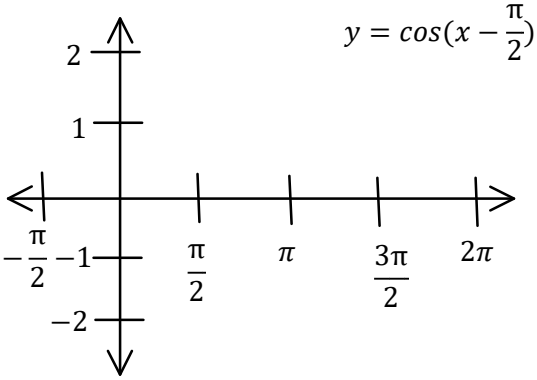


$y = sin(x - \frac{3\pi}{2})$

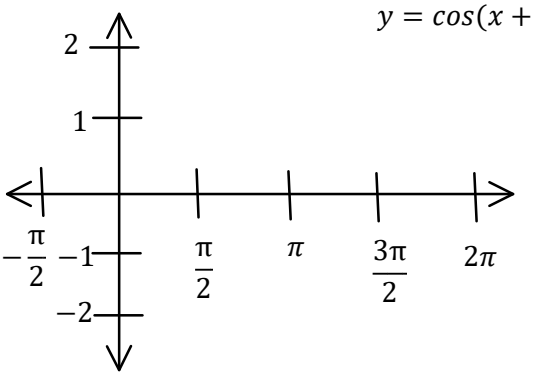


Determine c, and the equation $y = cos(x - c)$

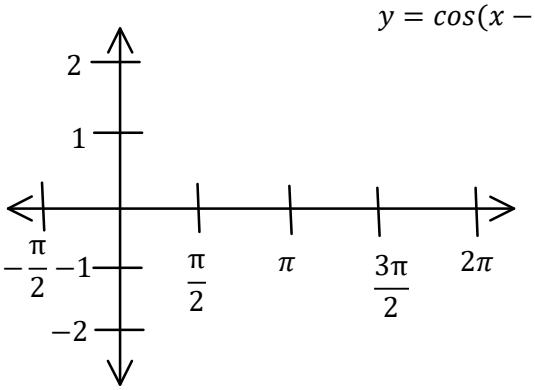
$y = cos(x - \frac{\pi}{2})$



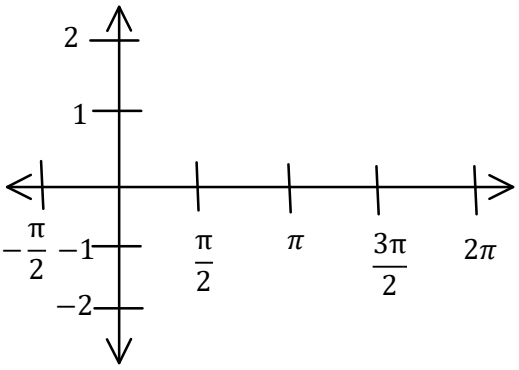
$y = cos(x + \frac{\pi}{2})$



$y = cos(x - \pi)$



$y = sin(x - \frac{3\pi}{2})$



C12 - 5.4 - Graph Homework

$y = 2sinx + 1$

$y = \cos\left(x - \frac{\pi}{2}\right) + 2$

$y = -2sinx + 1$

$y = -\cos\left(x - \frac{\pi}{2}\right) + 2$

$y = 3\cos(x - \pi) + 1$

$y = 3\sin\left(x + \frac{\pi}{3}\right) - 2$

$y = 3\sin(2x) + 1$

$y = 3\cos\left(\frac{1}{2}(x - \frac{\pi}{2})\right) + 1$

$y = \sin(2x + \frac{\pi}{2})$

$y = \sin(2\left(x + \frac{\pi}{4}\right))$

C12 - 5.4 - Max Min Points HMK

A sinusoidal function has a maximum at $(2,9)$ and a minimum at $(6,-1)$. Find the equation.

A sinusoidal function has a maximum at $(-4,12)$ and a minimum at $(8,-4)$. Find the equation.

C12 - 5.5 - Ferris Wheel WS

A Ferris wheel with radius 12 m is 2 m off the ground. It takes 20 seconds for one complete revolution. Draw a diagram of the Ferris wheel, graph the height of a passenger starting at the bottom with a table of values and write the equation. How high at 6 second in. How many seconds above 18m in one cycle.

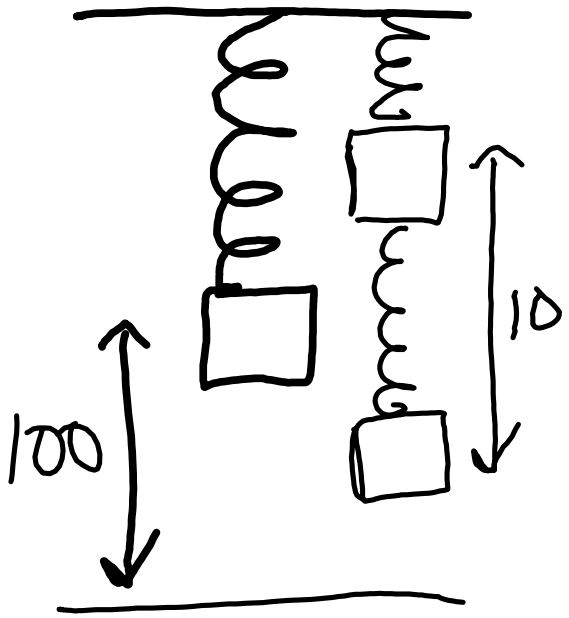
A Ferris wheel with radius 14 m is 1 m off the ground. It takes 30 seconds for one complete revolution. Draw a diagram of the Ferris wheel, graph the height of a passenger starting at the bottom with a table of values and write the equation. How high at 10 second in. How many seconds above 25m in one cycle.

C12 - 5.5 - Tide HMK

Graph and find Equation. High tide of 20 m at noon, Low tide of 8 m at 6:30 pm. Find depth at 1:12 pm. Find time above 10m in one cycle.

Graph and find Equation. High tide of 18 m at 10am, Low tide of 2 m at 4:24 pm. Find depth at 7:30 am. Find time above 12m in one cycle.

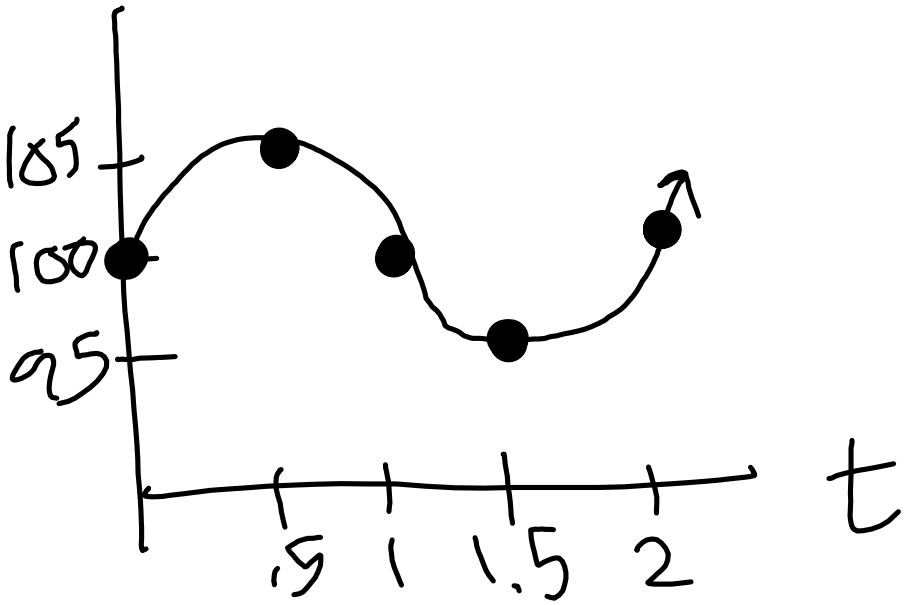
C12 - 5.5 - Trig Spring



t	h
0	100
.5	105
1	100
1.5	95
2	100

$T = 2$

$\frac{P}{4} = \frac{2}{4} = 0.5$



C12 - 6.1 - Ratios $cscx\ secx\ cotx$ HW

Simplify

$sinxsecx$ $cosxcosx$ $tanxcotx$ $cscxcscx$

$sinxsinx$ $cosxsecx$ $tanxcscx$ $secxsecx$

$sinxcosx$ $cosxcscx$ $tanxtanx$ $cotxssecx$

$sinxcotx$ $cosxtanx$ $cotxcotx$

$sinxcscx$ $cosxsinx$ $tanxsinxcotx$

Simplify to $sinx$ and $cosx$

$sinxtanx$ $cosxcotx$ $tanxsecx$ $cscxcotx$ $cscxsecx$

C12 - 6.1 - Ratios $cscx\ secx\ cotx$ Notes

Simplify

$\sin^2 xcscx$

$\csc^2 x\ sinx$

$cscxcos^2 x$

$\sec^2 xcosx$

$\sin^2 xcsc^2 x$

$\sin^2 xcot^2 x$

$\cos^2 xsec^2 x$

$\cos^2 xtan^2 x$

$\csc^2 xsec^2 x$

$\tan^2 xcot^2 x$

$\csc^2 xcot^2 x$

$\sec^2 xtan^2 x$

C12 - 6.1 - Ratios $cscx\ secx\ cotx$ HW

Simplify

$\frac{sinx}{sinx}$ $\frac{sinx}{cosx}$ $\frac{1}{sinx}$ $\frac{cscx}{cscx}$ $\frac{1}{tanx}$

$\frac{cotx}{cotx}$ $\frac{1}{cosx}$ $\frac{1}{cotx}$ $\frac{sinx}{cotx}$ $\frac{secx}{secx}$

$\frac{cosx}{cosx}$ $\frac{1}{cscx}$ $\frac{tanx}{tanx}$ $\frac{cosx}{sinx}$ $\frac{1}{secx}$

$\frac{sinx}{tanx}$ $\frac{cosx}{cotx}$ $\frac{cosx}{tanx}$ $\frac{cosx}{cotx}$

$\frac{tanx}{sinx}$ $\frac{tanx}{cosx}$ $\frac{secx}{cosx}$ $\frac{cscx}{cosx}$ $\frac{cotx}{cosx}$

Try it in your head!

$\frac{cosx}{secx}$ $\frac{cosx}{cscx}$ $\frac{tanx}{cscx}$ $\frac{secx}{tanx}$ $\frac{cotx}{secx}$

$\frac{cscx}{tanx}$ $\frac{secx}{cotx}$ $\frac{cscx}{secx}$ $\frac{cscx}{cotx}$

C12 - 6.1 - Ratios $cscx\ secx\ cotx$ HW

Simplify

$\frac{sinxcotx}{\sec x}$

$\frac{cosxtanx}{secx}$

$\frac{cscxtanx}{cscx}$

$\frac{cotxsec^2x}{\csc^2 x}$

$\frac{tanxcsc^2x}{\sec^2 x}$

$\frac{cosxsec^2x}{\sec^2 x}$

$\frac{sinxcsc^2x}{\csc^2 x}$

C12 - 6.2 - Add Subtract Fractions WS

Simplify

$\frac{1}{cosx}+\frac{sinx}{cosx}$

$\frac{cosx}{sinx}+\frac{1}{sinx}$

$cotx+cscx$

$secx+tanx$

$sinx+cscx$

$sinx+secx$

$cosx+secx$

$cosx+cscx$

$sinx-secx$

$cosx-cotx$

$cosx+sinxtanx$

$sinx+cosxcotx$

C12 - 6.2 - Add Subtract Fractions Pythag WS

Simplify

$cscx - cotxcosx$ $secx - tanxsinx$ $cscx\,cos^2 x + sinx$ $secx\,sin^2 x + cosx$

$1 + \frac{\sin^2 x}{\cos^2 x}$ $\frac{1}{\cos^2 x} - 1$ $1 - \frac{1}{\sec^2 x}$ $\frac{1}{\sin^2 x} - 1$

$\frac{cosx + cotx}{1 + sinx}$ $\csc^2 x - \frac{cotx}{sinx}$

C12 - 6.2 - Add Subtract Fractions Pythag WS

Simplify

$$\frac{1}{1-sinx}+\frac{1}{1+sinx}$$

$$\frac{cosx}{1+cosx}+\frac{cosx}{1-cosx}$$

$$\frac{1}{1-sinx}-\frac{1}{1+sinx}$$

$$\frac{cosx}{1+cosx}-\frac{cosx}{1-cosx}$$

$$\frac{1}{1+cosx}-\frac{1}{1-cosx}$$

$$\frac{cosx}{1+sinx}+\frac{1+sinx}{cosx}$$

C12 - 6.2 - Add Subtract Fractions Complex WS

Simplify

$\dfrac{1+\dfrac{1}{sinx}}{cotx}$

$\dfrac{1+\dfrac{1}{cosx}}{tanx}$

$\dfrac{secx}{1+\dfrac{1}{cosx}}$

$\dfrac{tanx}{1+\dfrac{1}{cosx}}$

$\dfrac{secx}{1+\dfrac{sinx}{cosx}}$

$\dfrac{1+sinx}{1+cscx}$

$\dfrac{1+cscx}{1+secx}$

$\dfrac{1+tanx}{1+cotx}$

$\dfrac{cscx+secx}{cotx+1}$

$\dfrac{cscx+secx}{tanx+1}$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$sinxsecx$	$tanx$

$cosxtanx$	$sinx$

$sinxcscx$	1

$cosxcscx$	$cotx$

$cosxsecx$	1

$tanxcscx$	$secx$

$cotxsecx$	$cscx$

$sinxcotx$	$cosx$

$cosxcotx$	$\frac{\cos^2 x}{\sin x}$

$cotxcotx$	$\cot^2 x$

$cosxsinx$	$sinxcosx$

$\sin^2 x$	$sinxsinx$

$tanxsecx$	$\frac{sinx}{\cos^2 x}$

$tanxcotx$	1

Make one up!	

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$\frac{sinx}{tanx}$	$cosx$

$\frac{cosx}{secx}$	$\cos^2 x$

$\frac{1}{cosx}$	$secx$

$\frac{tanx}{sinx}$	$secx$

$\frac{tanx}{cosx}$	$\frac{sinx}{\cos^2 x}$

$\frac{sinx}{sinx}$	1

$\frac{sinx}{cotx}$	$\frac{\sin^2 x}{\cos x}$

$\frac{sinx}{cosx}$	$tanx$

$\frac{cosx}{cotx}$	$sinx$

$\frac{secx}{tanx}$	$cscx$

$\frac{tanx}{cscx}$	$secx$

$\frac{cscx}{cotx}$	$cosx$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$cotx + cscx$	$\frac{cosx + 1}{sinx}$

$\frac{1 + sinx}{cosx}$	$secx + tanx$

$sinx + cscx$	$\frac{\sin^2 x + 1}{sinx}$

$sinx + secx$	$\frac{sinxcosx + 1}{cosx}$

$2sinx - \frac{1}{cscx}$	$sinx$

$secx - tanxsinx$	$cosx$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$cosx + sinxtanx$	$secx$

$cscx\,cos^2 x + sinx$	$cscx$

$\frac{cosx + cotx}{1 + sinx}$	$cotx$

$\csc^2 x - \frac{cotx}{sinx}$	$\frac{1}{1 + cosx}$

1	$\frac{(1 - \sin^2 x)}{\cos^2 x}$

$\cot^2 x$	$\frac{\cos^2 x}{1 - \cos^2 x}$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$1-\frac{1}{\sec^2 x}$	$\sin^2 x$

$1-\frac{1}{\cos^2 x}$	$-\tan^2 x$

$1+\frac{1}{\tan^2 x}$	$\csc^2 x$

$2-\frac{1}{\csc^2 x}$	$1+\cos^2 x$

$cscx\ cos^2 x + sinx$	$cscx$

$secx\ sin^2 x + cosx$	$secx$

C12 - 6.3 - Proofs Add Subtract Foil Factor Pythag WS

Prove the left hand side equals the right hand side

$\frac{(cscx + cotx)(cscx - cotx)}{\sin^2 x}$ | $\csc^2 x$

$\frac{cosx}{1 + sinx} + \frac{1 + sinx}{cosx}$ | $2secx$

$\frac{1}{1 - cosx} + \frac{1}{1 + cosx}$ | $2\csc^2 x$

$\frac{cosx}{1 - cosx} - \frac{cosx}{1 + cosx}$ | $2\cot^2 x$

$\frac{1}{1 - cosx} - \frac{1}{1 + cosx}$ | $2cotxcscx$

$(sinx - cosx)^2$ | $1 - 2sinxcosx$

C12 - 6.3 - Proofs Add Subtract Foil Factor Pythag WS

Prove the left hand side equals the right hand side

$cosx - cotx$	$cotx(sinx - 1)$

$secx\ sin^2 x + cosx$	$secx$

$3 - sin^2 x$	$2 + \cos^2 x$

$sinx - cscx$	$\frac{-\cos^2 x}{sinx}$

$1 + \frac{\sin^2 x}{\cos^2 x}$	$\sec^2 x$

$\frac{1 + sinx}{1 + cscx}$	$\frac{sinx}{1 - sinx}$

C12 - 6.3 - Proofs Add Subtract Comp Frac Pythag WS

Prove the left hand side equals the right hand side

$\frac{cosx+1}{sinx}$	$1+\frac{1}{\frac{cosx}{tanx}}$

$\frac{1+\frac{1}{sinx}}{cotx}$	$\frac{1+sinx}{cosx}$

$\frac{cscx}{1+\frac{1}{sinx}}$	$\frac{1}{1+sinx}$

$\frac{cosx}{1+sinx}$	$\frac{cotx}{1+\frac{1}{sinx}}$

$\frac{cscx}{1+\frac{cosx}{sinx}}$	$\frac{1}{sinx+cosx}$

$\frac{1}{1+tanx}$	$\frac{cosx}{sinx+cosx}$

C12 - 6.3 - Proofs Add Subtract Comp Frac Pythag WS

Prove the left hand side equals the right hand side

$\frac{1+sinx}{1+cscx}$ | $sinx$

$cosx$ | $\frac{1+cosx}{1+secx}$

$\frac{1+secx}{1+cscx}+1$ | 2

$\frac{1+cotx}{1+tanx}$ | $cotx$

$\frac{cscx+secx}{cotx+1}$ | $secx$

$cscx$ | $\frac{cscx+secx}{tanx+1}$

C12 - 6.4 - Proofs Conjugate HW

$\frac{sinx}{1+cosx}$	$\frac{1-cosx}{sinx}$

$\frac{cosx}{1-sinx}$	$\frac{1+sinx}{cosx}$

$\frac{sinx}{1-cosx}$	$\frac{1+cosx}{sinx}$

$\frac{cosx}{1+sinx}$	$\frac{1-sinx}{cosx}$

$secx + tanx$	$\frac{cosx}{1-sinx}$

C12 - 6.4 - FOIL Factor WS (See 4.5 Notes)

Distribute/Foil

$sinx(1 - sinx)$

$cosx(sinx + 1)$

$(1 + cosx)(1 - cosx)$

$(sinx - cosx)^2$

$(sinx + 2)(sinx - 1)$

$(cosx + 1)(cosx - 3)$

Factor

$\sin x - \sin^2 x$

$sinxcosx + cosx$

$cosx + \cos^2 x$

$1 - \sin^2 x$

$1 + \sin^2 x$

$\sin^3 x - sinx$

$cos^2 x + cosx - 2$

$cos^3 x + \cos^2 x - 2cosx$

$cos^4 x - \cos^2 x - 2$

$2\sin^2 x + sinx - 1$

$cscx^2 - 2cscx - 3$

$2sinx - \frac{1}{sinx} + 1$

C12 - 6.4 - Proofs FOIL Factor Pythag WS (See 4.5 Notes)

Prove the left hand side equals the right hand side

$(sinx-2)(sinx+1)$	$\sin^2 x - sinx - 2$

$(1+sinx)(1-sinx)$	$\cos^2 x$

$(1+cosx)(1-cosx)$	$\sin^2 x$

$(2cosx-1)(cosx+2)$	$2\cos^2 x + 3cosx - 2$

Make up two!

C12 - 6.5 - Expand Sum Difference WS

Expand:

$\sin(x+\frac{\pi}{3})$

$\sin(x-\pi)$

$\cos(x+\frac{\pi}{6})$

$\cos(x+\frac{\pi}{4})$

Find the exact value of the following:

$cos15^o =$

$sin75^o =$

$\cos\left(\frac{\pi}{12}\right)=$

$sin{-}15^o=$

$csc15^0$

$\cos\left(\frac{7\pi}{12}\right) =$

C12 - 6.5 - Simplify Sum Difference WS

Simplify to a single trigonometric identity:

$cos2x\ cosx + sin2x\ sinx$

$sin3x\ cosx - cos3x\ sinx$

$sinA\ cos2A + cosA\ sin2A$

$cosB\ cos3B - sinB\ sin3B$

Find the exact value of:

$\cos\left(\frac{\pi}{3}\right)\cos\left(\frac{\pi}{6}\right) + \sin\left(\frac{\pi}{3}\right)\sin\left(\frac{\pi}{6}\right)$

$\sin\left(\frac{11\pi}{12}\right)\cos\left(\frac{\pi}{12}\right) - \cos\left(\frac{11\pi}{12}\right)\sin\left(\frac{\pi}{12}\right)$

C12 - 6.6 - Double Angle HW

Simplify the following.

$4 \sin 3x \cos 3x =$

$6 \sin \frac{x}{2} \cos \frac{x}{2} =$

$8 \sin(\frac{\pi}{4}) \cos \frac{\pi}{4} =$

$\cos^2 x - \sin^2 x =$

$\cos^2 \frac{1}{2}x - \sin^2 \frac{1}{2}x =$

$2 \cos^2 2x + 2 \sin^2 2x =$

$2 \cos^2 \frac{x}{4} - 1 =$

$1 - 2 \sin^2 \frac{x}{2} =$

$3 - 6 \sin^2 3x =$

$2 \cos^2 \frac{\pi}{2} - 1 =$

$\sec 10x \, (\sin^2 5x - \cos^2 5x) =$

$2 \sin 4x \, (\cos^2 2x - \sin^2 2x \,) =$

C12 - 6.6 - Double Angle HW

Simplify the following.

$1 + cos2x =$

$1 - cos2x =$

$cos2x + 1 =$

$cos2x - 1 =$

$\frac{1 + cos2x}{\sin^2 x} =$

$\frac{1 - cos2x}{\tan^2 x} =$

$\frac{cos2x - 1}{\sin^2 x} =$

$\frac{cos2x - 1}{2\csc^2 x} =$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$sinxcosx = 0$

$sin2x = 0$

$sin2x = 1$

$cos2x = 0$

$cos2x = -1$

$cos2x = 1$

$sin4x = 0$

$cos3x = -1$

$\cos\left(\frac{x}{2}\right) = 1$

$\sin\left(\frac{1}{3}x\right) = -1$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$sin2x + cosx = 0$

$sinx + cos2x = 1$

$sinx - cos2x = -1$

$sin2x = -sinx$

$\sin^2 x + cos2x = 0$

$\cos^2 x - cos2x = 0$

$\cos^2 x - cos2x = 1$

$sinx - cos2x = 0$

$cosx + cos2x = 0$

$cosx - cos2x = 0$

$3sinx + cos2x = -1$

$3cosx + cos2x = 1$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$sin2x = \frac{1}{2}$

$cos2x = -\frac{1}{\sqrt{2}}$

$\cos\left(\frac{x}{2}\right) = \frac{1}{2}$

$cos3x = \frac{\sqrt{3}}{2}$

$tan2x = \sqrt{3}$

$sin4x = \frac{1}{\sqrt{2}}$

$\sin(\frac{1}{3}x) = \frac{\sqrt{3}}{2}$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$2cotxsin^2x = 1$

$2tanxscos^2x = \frac{1}{2}$

$2sinxcosx + 1 = 0$

$4\cos^2 2x - \sqrt{3} = 0$

$cos2x = 2\sin^2 x$

$\sin^2 x - \cos^2 x = 0$

C12 - 7.1 - Exponents Laws HW

Simplify

$4^2 \times 4^3 =$ $3^2 \times 3^3 =$ $\frac{5^3}{5^2} =$ $\frac{7^3}{7^5} =$

$\frac{3^2}{81} =$ $(3^2)^4 =$ $(3x)^2 =$ $(x+2)^2 =$

$\left(\frac{1}{3}\right)^2 =$ $\left(\frac{2}{5}\right)^2 =$ $5^0 =$ $6^0 =$

Change Base

$25 =$ $9 =$ $8 =$ $27 =$

Change to base 2

$16 =$ $4^2 =$ $16^2 =$ $27^2 =$

Change to base 4

$16 =$ $16^2 =$ 64 256=

Write as a single of power

$3^2 \times 4^2 =$ $2^2 \times 5^2 =$

Write as a multiplication of powers

$(2 \times 3)^x =$ $(6)^x =$

Write with a positive exponents

$5^{-3} =$ $\frac{3}{x^{-5}} =$ $2x^{-2} =$ $\left(\frac{2}{3}\right)^{-2} =$

Write with a negative exponents

$\frac{1}{5^2} =$ $\frac{1}{5} =$ $2^3 =$ $\frac{x}{3^2} =$

Change Base with negative exponent

$\frac{1}{25} =$ $\frac{1}{9} =$ $\frac{1}{16} =$ $\frac{1}{16} =$

C12 - 7.1 - Simplifying/Separating Exponents HW

Simplify to a single exponent

$2^x \times 2 =$

$3^x \times 3 =$

$(6^2)^x =$

$(9^x)^2 =$

$\frac{2^x}{2} =$

$\frac{7^x}{7} =$

$\frac{5}{5^x} =$

$\frac{4}{4^x} =$

$5^{2x} \times 5 =$

$3^{2x} \times 3^x =$

$3^x \times 9 =$

$2^x \times 16 =$

$\frac{4^x}{8} =$

$\frac{4^x}{256} =$

$\frac{49}{7^x} =$

$\frac{81}{3^x} =$

C12 - 7.1 - Simplifying/Separating Exponents HW

Separate into a multiplication/division/or use brackets with the same base. ($Isolate\ \#^x$)

$3^{x+1} =$ $5^{x-1} =$ $2^{1-x} =$ $6^{2x+1} =$

$7^{2x} =$ $2^{2x+1} =$ $5^{x-1} =$ $6^{2x} =$

$3^{1-x} =$ $2^{2x+3} =$ $5^{x-3} =$ $7^{x+1} =$

$3^{2-2x} =$ $6^{3x} =$ $7^{3x+2} =$ $1^{2x} =$

Separate into a multiplication/division/or use brackets with the different bases. ($Isolate\ \#^x$)

$6^x =$ $10^x =$ $14^x =$ $15^x =$

$8^x =$ $8^x =$ $12^x =$ $12^x =$

C12 - 7.1 - Simplifying/Separating Exponents HW

Simplify

$\frac{2^3 \times 2^5}{2^2} =$

$\frac{4^8 \times 2^5}{32} =$

$\frac{8^3 \times 2^{10}}{256 \times 4^2} =$

$\frac{2^8 \times 2^{-3}}{16} =$

$\frac{8^{-1} \times 32^4}{64^{-2}} =$

$\frac{2^{-1} \times 16^{-4}}{128^{-2}} =$

$\frac{2^{2x+1} \times 2^2}{2^x} =$

$\frac{4^x \times 8}{2} =$

$\frac{3^{3x+2}}{3^{x+1}} =$

$\frac{5^{4x-1}}{125^x} =$

$\frac{4^x \times 8^{3x+1}}{16^{2x+3}} =$

C12 - 7.2 - Separate/Factoring/Solving Exponents Notes

Solve for x

$3^x = 27^2$

$2^x = 16^2$

$5^x 5^2 = 5^5$

$3^x 3 = 3^5$

$4^{x+1} = 2 \times 8^{2x-5}$

$64^{x+1} = 4^{2x}$

$16^{2x+1} = 2^{2x}$

$\left(\frac{1}{3}\right)^{-x-1} = 27^{2x-8}$

$7 \times 3^{2x^2+5x} = \frac{7}{9}$

C12 - 7.2 - Separate/Factoring/Solving Exponents Notes

Solve for x

$5^{x^2-5} = 625$

$5^{x^2-x} = 1$

$3^{x^2+x} = 9$

x=+-3

x=0,1

x=1,-2

$3^{x^2-1} = 27$

$4^{x^2-3x} = 1$

$5^{x^2-3x} = \frac{1}{25}$

x=+-2

x=0,3

x=2,1

C12 - 7.2 - Separate/Factoring/Solving Exponents Notes

Solve for x

$5(2^x) + 2^x = 48$

$3^x + 4(3^x) - 45 = 0$

$-3(5^x) = 2(5^x) - 5$

x=3

x=2

x=0

$3^x + 3^{x+1} = 108$

$2^x - 2^{x+3} + 15 = 0$

$9^{x+2} - 243 = 81^x - 9$

x=3

x=1

x=.5

C12 - 7.2 - Separate/Factoring/Solving Exponents Notes

Solve for x

$(2^x)^2 - 6(2^x) + 8 = 0$

x=1,2

$(3^x)^2 - 2(3^x) - 3 = 0$

x=1

$3^{2x} - 4(3^x) = -3$

x=1,0

$4^{2x} = 3(4^x) - 2$

x=1/2,0

C12 - 7.2 - Separate/Factoring/Solving Exponents Notes

Solve for x

$5^x - 5^{x-1} - 4 = 0$

x=1

$10 - 3^x = 3^{2-x}$

x=2,0

$7^x - 28(7^{-x}) = 3$

x=1

$3(3^x)^2 - 7(3^x) + 2 = 0$

x=-1, 0.6309

C12 - 7.2 - Separate/Factoring/Solving Exponents Notes

$Solve\ for\ x$

$4^{x+1} - 5(2^{x+2}) + 16 = 0$

$6^x - 4(3^x) - 3(2^x) + 12 = 0$

x=0,2

x=1,2

$(2^x)^2 - 4 = 0$

$(3^x)^2 - 6(3^x) + 9 = 0$

x=1

=1

C12 - 7.3 - Word Problems HW

If you deposit $1000 in the bank for five years at 10% interest how much will you have after 5 years?

If you deposit $2000 in the bank for five years at 8% interest how much will you have after 10 years?

If you deposit $5000 in the bank for five years at $\frac{1}{2}$% interest how much will you have after 50 years?

If you deposit $100 in the bank, how long will it take to grow to $\$51200$ if it doubles each year?

How many times as intense is an earthquake of 7.0 than 4.0?

An earth quake in California of Richter 8.5 Magnitude was 100 times as strong as an earth quake in Vancouver of what Richter Magnitude.

C12 - 7.3 - Word Problems HW

If you deposit $3000 in the bank for eight years at 12% interest, compounded monthly, how much will you have after 8 years?

If you deposit $8000 in the bank for five years at 4% interest, compounded quarterly, how much will you have after 2 years?

If a population starts at 100 and doubles every five hours, how large will the population grow in 20 hour?

How long to triple your money at 8%

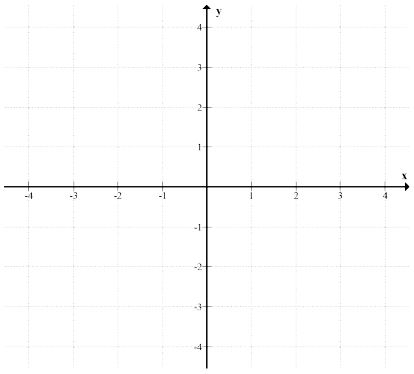
If the population starts at 500 and grows continuously at a rate of 0.04, how large will it grow after 30 days?

C12 - 7.4 - Exponent 2^x Reflections Graphs HW

Draw the following graphs using a table of values.

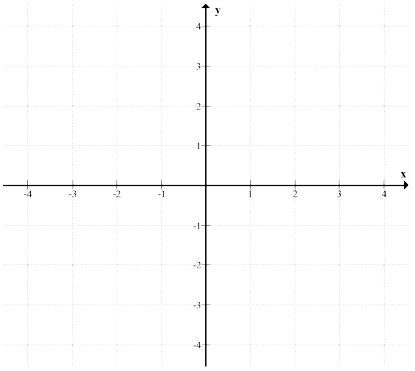
$y = 2^x$

x	y
-1	
0	
1	
2	



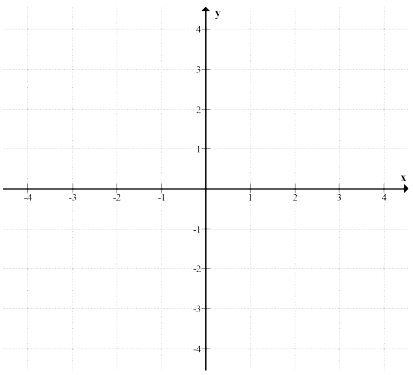
$y = 2^{-x}$

x	y
-2	
-1	
0	
1	



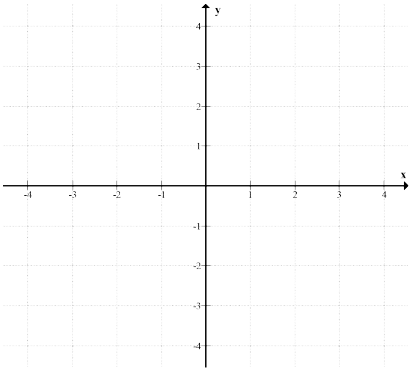
$y = -2^x$

x	y
-1	
0	
1	
2	



$y = -2^{-x}$

x	y
-2	
-1	
0	
1	

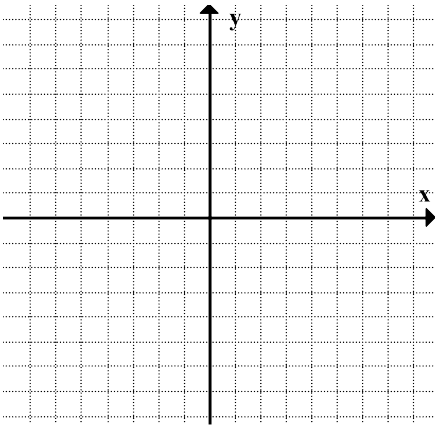


C12 - 7.4 - Exponent 3^x Reflections Graphs HW

Draw the following graphs using a table of values.

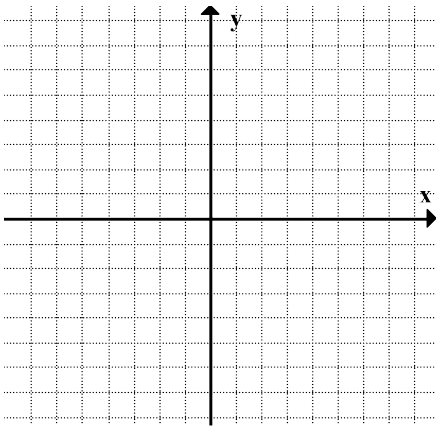
$y = 3^x$

x	y
-1	
0	
1	
2	



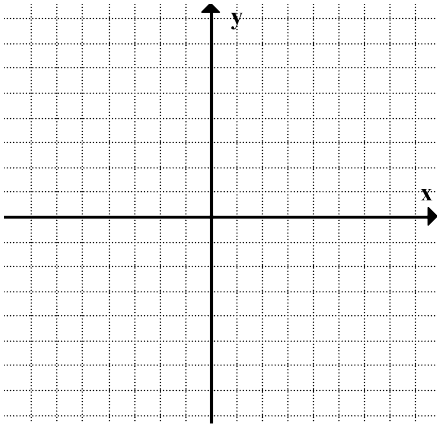
$y = 3^{-x}$

x	y
-2	
-1	
0	
1	



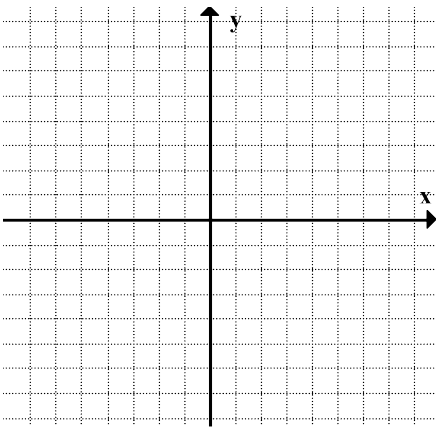
$y = -3^x$

x	y
-1	
0	
1	
2	



$y = -3^{-x}$

x	y
-2	
-1	
0	
1	

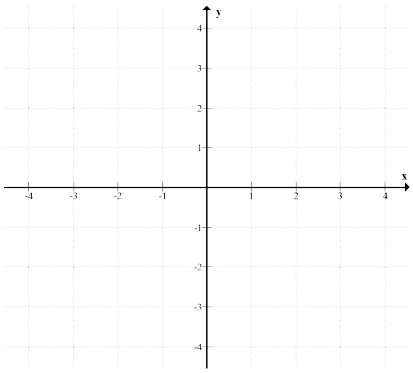


C12 - 7.4 - 2^x Translations Reflections Graphs HW

Draw the following graphs using a table of values.

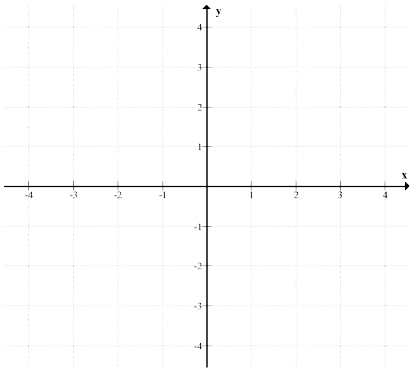
$y = 2^x + 1$

x	y
-1	
0	
1	
2	



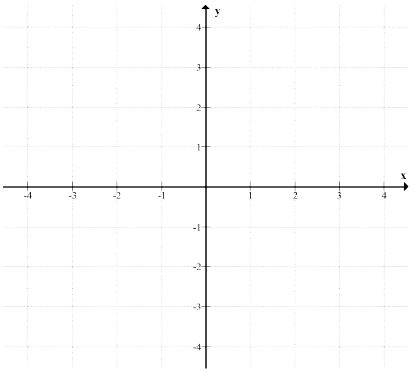
$y = 2^{-x} - 2$

x	y
-2	
-1	
0	
1	



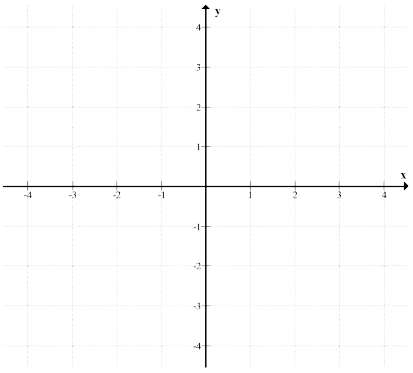
$y = -2^{x+1}$

x	y
-1	
0	
1	
2	



$y = 2^{-x+2} - 2$

x	y
-2	
-1	
0	
1	

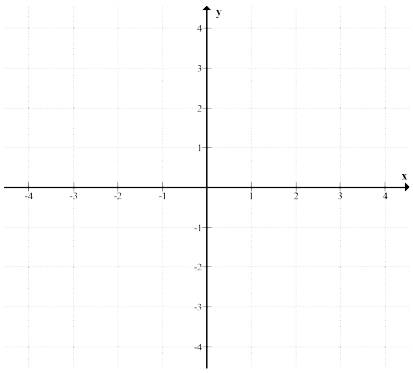


C12 - 7.4 - 2^x Tramsformations Graphs HW

Draw the following graphs using a table of values.

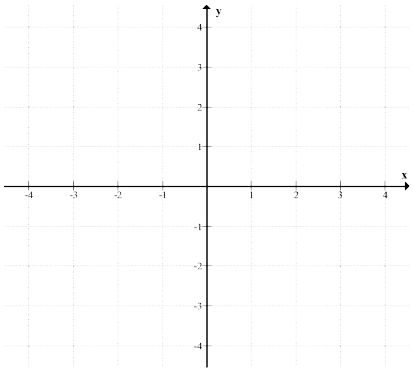
$y = 2(2)^x$

x	y
-1	
0	
1	
2	



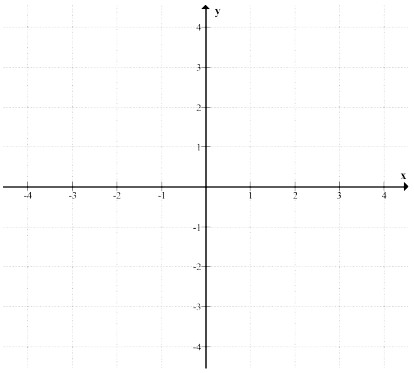
$y = 2^{2x}$

x	y
-2	
-1	
0	
1	



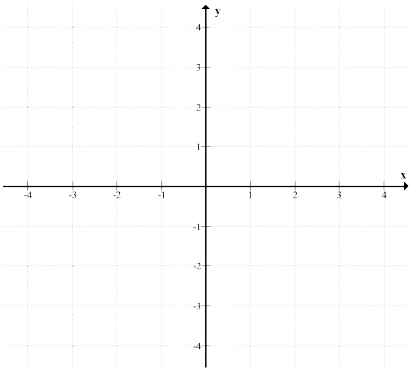
$y = 2^{2x+4}$

x	y
-1	
0	
1	
2	



$y = 2^{-\frac{1}{2}x+2} - 1$

x	y
-2	
-1	
0	
1	



C12 - 8.1 - $\log_b a = ?$ Definition HW

Evaluate. Think of what power must you raise the base to in order to equal the "thing you are logging".

$\log_2 8 = 3$

$\log_2 16 =$

$\log_3 9 =$

$\log_2 1024 =$

$\log_2 4 =$

$\log_2 64 =$

$\log_2 32 =$

$\log_3 27 =$

$\log_4 16 =$

$\log_1 49 =$

$\log_{10} 100 =$

$-\log_2 16 =$

$\log_5 0 =$

$\log_0 3 =$

$\log_7 1 =$

$\log_2 \left(\frac{1}{4}\right) =$

$\log_4 2 =$

$\log_{\frac{1}{4}} \frac{1}{16} =$

$\log_{\frac{1}{2}} 8 =$

Evaluate. Think of what power must you raise the base to in order to equal the "thing you are logging".

$\log_3 3^2 =$

$\log_2 2^4 =$

$\log_4 4^3 =$

$\log_5 5^x =$

$\log_5 5^{78} =$

$\log_3 3^{\frac{1}{2}} =$

$\log_a a^2 =$

$\log_x x^5 =$

Change the base of the "thing you are logging" to be the same as the base of the log, and evaluate as above.

$\log_2 4 =$

$\log_3 27 =$

$\log_5 125 =$

$\log_6 36 =$

$\log_2 16 =$

$\log_8 512 =$

$\log_5 \sqrt[3]{5} =$

$\log_6 \frac{1}{6} =$

Use your calculator to evaluate.

$\log 7 =$

$\log 0.05 =$

$log80 =$

$log0 =$

$\log(-2) =$

Evaluate

$\log_a a =$

$\log_x 1 =$

$\log_{2a} 4a^2 =$

$\log_b b^x =$

$\log_{2x} 8x^3 =$

$\log_e e^2 =$

$ln\ e^2 =$

Evaluate

$log\sqrt{10} =$

$log1 =$

$\log\ 1000 =$

$log0.1 =$

$\log_{100} 10\,000 =$

C12 - 8.1 - $log_b\, a =$c in Exp/Log Form HW

Express in exponential form

$\log_2 8 = 3$

$\log_5 25 = 2$

$\log_3 27 = 3$

$\log_a b = c$

$\log_6 1 = 0$

$\log_2\left(\frac{1}{2}\right) = -1$

$\log_{10} 1000 = 3$

$\log_4 2 = \frac{1}{2}$

$\log_{\frac{1}{4}}\left(\frac{1}{16}\right) = 2$

$\log_{\frac{1}{3}} 9 = -2$

$\log_7(x+2) = y$

$\log 100 = 2$

$\log_4 1 = 0$

$1 = \log_5 5$

$\log_{64} 16 = \frac{2}{3}$

$q = \log_x z$

$\log_2 4 + 2 = 4$

Express in logarithmic form

$2^3 = 8$

$5^2 = 25$

$64 = 8^2$

$8^{\frac{1}{3}} = 2$

$2^6 = 64$

$10^{-2} = 0.01$

$a = b^c$

$6^{-2} = \frac{1}{36}$

$1000 = 10^3$

$4^{-2} = \frac{1}{16}$

$\frac{1}{125} = 5^{-3}$

$x^y = z$

$18^0 = 1$

$4^1 = 4$

$\left(\frac{1}{5}\right)^2 = \frac{1}{25}$

C12 - 8.1 - $\log_b x = c, \log_x a = c$ HW

Find x

$\log_2(x) = 3$ $\log_4 x = 3$ $\log_5 x = 2$ $\log_4 x = \frac{1}{2}$

$\log_5 x = 0$ $\log_5 x = -2$ $\log_3 x = -2$ $\log_{\sqrt{2}} x = 4$

$\log_2(x+2) = 2$ $\log_3(x-5) = 2$ $\log_{10}(x-50) = 2$ $\log_5(20+x) = 2$

$\log_5(x^2+50) = 3$ $\log_3(44-x) = 4$ $\log_3(5x+7) = 2$ $\log_5 2x = -5$

$\log_x(8) = 3$ $\log_x(144) = 2$ $\log_x(81) = 2$ $\log_x 5 = 1$

$\log_x 5 = 3$ $\log_x 125 = 3$ $\log_x \frac{1}{16} = 4$ $\log_x(64) = 3$

$\log_x 9 = \frac{1}{2}$ $\log_x 8 = \frac{2}{3}$ $\log_x 27 = \frac{3}{2}$ $\log_x \sqrt{27} = \frac{3}{2}$

$\log_x 4 = \frac{2}{3}$ $\log_x \frac{27}{8} = \frac{3}{2}$ $\log_x \frac{64}{27} = \frac{3}{2}$

C12 - 8.1 - $\log_b a = x$ *and Factoring HW*

Solve

$\log_4(16) = x$ $\log_8 16 = x$ $\log_2 64 = x$ $\log_2(8) = x$

$\log_{10} 100 = x$ $\log_7(343) = x$ $\log_4 \frac{1}{8} = x$ $\log_{\frac{1}{5}} 125 = x$

$\log_{81} 3 = x$ $\log_{16} 8 = x$ $\log_{\frac{1}{2}} 16 = x$ $\log_{\frac{1}{2}} 1 = x$

$\log_{\frac{1}{3}} \frac{1}{9} = x$ $\log_{\frac{1}{9}} \frac{1}{3} = x$ $\log_{\sqrt{2}} 4 = x$ $\log_2 \sqrt[4]{8} = x$

$\log_{2x} 16 = 2$ $log_{x+1} 9 = 2$ $log_{x+2} 1 = 2$ $log_{x-1} 4 = 2$

$\log_{x+2} 9 = 2$

C12 - 8.2 - Logs Restrictions HW

State Restrictions

$\log x = 5$

$\log(x+1) = 3$

$\log_2(2x-3) = 5$

$\log_2(-x) = 5$

$\log_2(3-x) = 5$

$\log_x 3 = 7$

$\log_{x-1} 2 = 4$

$\log_3(x^2-1) = 5$

$\log_3(x^2-9) = 5$

$\log_3(x^2+4) = 5$

$\log_x(x-2) = 5$

$\log_x(x+3) = 5$

$\log_2 x^2 = 4$

$2\log_2 x = 4$

C12 - 8.3 - $\log a^m = m\log a$ Change of Base HW

Bring Exponent down in front and vice versa/both where allowed. Multiply/Distribute if necessary. Get rid of fractions and decimals.

$log6^3$ $log9^x$ $log5^{\frac{1}{3}}$ $log\sqrt{5}$ $\log\left(\frac{1}{3}\right)$ $\log 0.1$

$2log5^3$ $2log5^3$ $7log8^4$ $7log8^4$

$log2x^3$ $\log(2x)^3$ $logab^2$ $\log(ab)^2$

$2\log 3^{x-3}$ $2\log 3^{x-3}$ $log9^{x+1}$ $log3^{2x+5}$

Change Forms

$\frac{log8}{log2} =$ $\frac{\log_2 64}{log_2 4} =$ $\log_3 81 =$ $\log_5 25 =$

$\log_9 27 =$ $\log_{16} 64 =$ $\frac{1}{\log_{81} 3} =$ $\frac{1}{\log_{64} 4} =$

C12 - 8.3 - Rule 6 $\log_b^n a^n$ *HW*

Square the base and the log and evaluate

$\log_3 9$ $\log_2 4$ $\log_5 125$ $\log_7 49$

Take the base and the log to the exponent -1 *and evaluate*

$\log_{\frac{1}{2}} 8 =$ $\log_{\frac{1}{3}} 9 =$ $\log_{\frac{1}{4}} \frac{1}{2} =$ $\log_{\frac{1}{2}} \frac{1}{4} =$

Cube the base and the log

$\log_2 4 =$ $\log_3 4 =$

Change the base to 3

$\log_9 64 =$ $\log_{27} 8 =$ $\log_{\sqrt{3}} 2 =$

Change the base to 4

$\log_2 4 =$ $\log_{16} 25 =$ $\log_{\sqrt[3]{4}} 3 =$

C12 - 8.3 - Rule 6 $log_{b^n} a^n$ *Equations HW*

$\log_2 x + \log_4 x = 3$

$2\log_3 x - \log_9 x^2 = 2$

$(\log_2 x)(\log_3 4) = 4$

$(\log_x 36)(\log_6 27) = 6$

$(\log_5 16)(\log_4 25) = x$

$(\log_5 x)(\log_4 25)(\log_7 16) = 8$

C12 - 8.4 - $\log_b m + \log_b n = \log_b mn, log_b m - log_b n = log_b \frac{m}{n}$ HW

Simplify, express as a single log

$log3 + log4 =$ $\log_2 5 + \log_2 6 =$ $\log_3 20 - \log_3 4 =$

$2\log_4 8 - \log_4 16 =$ $log32 - 3log2 =$ $\log_2 5 + \log_2 3 + \log_2 4 =$

$\log_2 4 + \log_2 5 - 2\log_2 10 =$ $\log_3 4 + 2\log_3 20 - \log_3 10 =$

$log5 - log2 - log10 =$ $log5 - log2 + log10 =$

$log4 - log2 + log10 =$ $-log8 - log2 + log5 =$

Express as an addition of logs

$\log(4 \times 3) =$ $\log(2 \times 5 \times 7)$ $log4 =$ $log9 =$

$log10 =$ $log15 =$ $log21 =$ $log25 =$

$log30 =$ $log36 =$ $log20 =$

Express as a subtraction of logs

$\log\left(\frac{10}{3}\right) =$ $\log\left(\frac{3}{2}\right) =$ $log5 =$ $log7 =$

$\log 0.1 =$ $log0.5$

C12 - 8.4 - $\log_b m + \log_b n = \log_b mn \; log_b m - log_b n = log_b \frac{m}{n}$ HW

Express in terms of $loga, logb, logc$

$logab =$

$\log\left(\frac{b}{c}\right) =$

$\log\left(\frac{a}{bc}\right) =$

$\log\left(\frac{ab}{c}\right) =$

$log100a^2b^3 =$

$\log_4 \frac{16a^2}{c} =$

$\log\left(\frac{a^3}{b\sqrt{c}}\right) =$

$\log\frac{c^2}{10a^2} =$

$\log(bc)^2 =$

$\log\left(a\sqrt{b}\right) =$

$\log\left(\sqrt{ab}\right) =$

C12 - 8.4 - $\log_b m + \log_b n = \log_b mn$ $log_b m - log_b n = log_b \frac{m}{n}$ HW

Express in terms of $log3$ and $log4$.

$log12 =$ $log36 =$ $log48 =$ $log120 =$

$log0.12 =$ $\log\frac{9}{16} =$

Simplify the expression.

$\log(x+1) + \log 2 =$ $\log(x^2) - logx =$ $\log n^2 - 2log\sqrt{n} =$

$log\sqrt{m} + \log m^{\frac{3}{2}} =$ $\log_2 x - 2\log_2 8 =$ $\log_3 x + 2\log_3 4 =$

$\log(x+2) + \log(x+3) =$ $\log(x^2+5x+6) - \log(x+3) =$

C12 - 8.4 - $log2 = m, log3 = n, HW$

Given: $log2 = m$ $log3 = n$ *Solve in terms of* m *and* n:

$log4 =$ $log6 =$ $log8 =$

$log24 =$ $log18 =$ $log12 =$

$log20 =$ $log600 =$ $log0.3 =$

$log2x =$ $log9x =$ $log0.02 =$

$log1.5 =$ $log0.\overline{6}$ $log1.08 =$

$log0.06 =$ $log0.54 =$ $log5 =$

$\log_{\frac{1}{2}} 216$ $\log_{12} 72 =$ $\log_{6} 1728$

Given: $log9 = a$ $log25 = b$ *Solve in terms of* a *and* b:

$log3 =$ $log15 =$ $\log\frac{3}{5} =$

$log300 =$ $log1.\overline{6} =$

C12 - 8.5 - Log Operation HW

Solve using your calculator or your brain.

$log5 =$ $log10 =$ $log240 =$ $log0 =$

$log100 =$ $log4528 =$ $log1 =$ $log0.2 =$

$log20 =$ $log - 1 =$ $log1000 =$ $log9 =$

$log.01 =$ $log85 =$ $log0.1 =$

$log12345 =$ $log10^{12345} =$

$log_5 12 =$ $log_8 3 =$ $log_2 8192 =$ $\log_2 128 =$

$log12^3 =$ $log25^2 =$ $log100^2 =$ $log10^{-2} =$

$2log6^4 =$ $-log5^2 =$ $3log6^{-4} =$ $2log10^{\frac{1}{2}} =$

$3log12 =$ $2log25 =$ $2log100 =$ $-2log10 =$

$Expand: Bring\ Exponent\ down\ in\ front\ and\ distribute$

$log3^{x+4} =$ $log8^{2x-1} =$ $log8^{-x+1} =$ $2log4^{x+2} =$

Remove a greatest common Factor of x

$2xlog5 - xlog3 =$ $xlog7 - xlog2 =$ $xlog20 - xlog2 =$

C12 - 8.5 - Log = Log De-Log Equation HW

$log\ 2x = \log(x+1)$

$log_2\ x = \log_2(3-x)$

$log\ x = \log(2x+1)$

$log\ x = \log(x^2-2)$

$log\ 2x = \log(x-3)$

$\log_5(4x+3) = log_5(3x-2)$

$log6 = logx - log3$

$log24 = logx + log3$

$log8 = log2 - logx$

$log\ x + logx = log4$

$\log_4 x + \log_4 x^2 = \log_4 27$

$\log_7 3x = \log_7(x^2-4)$

$log\ x^2 + logx^2 = log81$

$3\ log\ x + logx = log256$

$2\ log\ x + logx^2 = log9$

$log\ x^2 - logx = log5$

$3\log_7 x + \log_7 x^2 = \log_7 32$

$5\log_9 x - \log_9 x^2 = \log_8 8$

$3\log_9 x + \log_9 x^2 = \log_9 32$

$\log_3(x-2) + \log_3(x-3) = log12$

$\log_3(6x+1) - \log_3(x-1) = log5$

$\log_3(3x+1) - \log_3(x-2) = log4$

C12 - 8.5 - Log Equation HW

$\log_2 x + \log_2 x = 2$

$\log_4 x = 3 - \log_4 x$

$\log_2 x + \log_2 x^2 = 6$

$2\log_2 x - \log_2(x-2) = 3$

$\log_x 5 + \log_x 2 = 3$

$\log_{x^2} 128 = \log_{x^2} 2 + 3$

$\log_5(x^2-1) = \log_5(x+1) + 2$

$\log_{x+1} 27 - \log_{x+1} 3 = 2$

$\log_2 5x - \log_2(x+1) = 2$

$\log_{x-1} 1 + \log_{x-1} 4 = 2$

$\log_2(-x) + \log_2(3-x) = 2$

$\log_2 x - 2 = -\log_2(x+2)$

$\log_3 2x - \log_3(x-2) = 1$

$\log_3(3x-12) - \log_3 x = 2$

C12 - 8.5 - Log Equation HW

$\log_3 2x - \log_3(x-2) = 1$

$\log_3(3x-12) - 2 = \log_3 x$

$\log_2 x + \log_2(x-7) = 3$

$\log_2 x + \log_2(x+1) = 1$

$\log_2(2x+4) = \log_2(x+2) + 2$

$\log_2 x + \log_2(x+4) = 5$

$\log_3 x + \log_3(x+2) = 1$

$\log_3 x + \log_3(x-6) = 3$

$\log_6 x + \log_6(x-5) = 2$

$\log_3(x^2+5x+6) - \log_3(x+2) = 1$

$2\log_5(x+2) - \log_5(x+2) = 1$

$\log_7(2x^2+7x+6) - \log_7(x+2) = 2$

C12 - 8.5 - Logs Factoring WS

$(logx)^2 + logx = 2$

$(logx)^2 = logx^5 + 4$

$2(logx)^2 - 3logx = -1$

$(logx)^2 - 9 = 0$

$(logx)^2 = 4$

$(logx)^2 - 7 = logx^6$

C12 - 8.6 - Log Both Sides HW

Solve for x

$4 = 2^x$

$12 = 2^x$

$99 = 10^x$

$38 = 6^x$

$4 = 3^x$

$14 = 2^x$

$267 = 10^x$

$0.2 = 6^x$

$5 = 4^x$

$30 = 5^x$

$27 = 5^x$

$9^x = 76$

$7 = 2^{2x}$

$80 = 3^{2x}$

$1080 = 2^{5x}$

$180 = 5^{\frac{x}{2}}$

$5 = 2^{\frac{1}{x}}$

$7^{\frac{2}{x}} = 9$

$18 = 2^{\frac{3}{x+1}}$

$40 = 5(3)^x$

$60 = 3(2)^x$

C12 - 8.6 - Log Both Sides HW

$4^{x+1} = 12$

$25 = 3^{x-2}$

$126 = 3^{x+1}$

$80 = 2^{3x-1}$

$2^{3-x} = 5^{x-2}$

$2^{2x-3} = 8^{x-1}$

$3^{2x+1} = 5^{x+1}$

$120 = 6(2)^{x+1}$

$80 = 4(2)^{3x-1}$

$25 = 4(3)^{x}$

$62 = 5(3)^{2x-1}$

C12 - 8.6 - Rule 7 $b^{\log_b x} = x$ Log HW

$2^{\log_2 5} = x$

$3^{\log_3 8} = x$

$2^{2\log_4 6} = x$

$3^{2\log_3 4} = x$

$4^{\log_2 6} = x$

$2^{\log_4 32} = x$

$2^{logx} = \frac{1}{4}$

$2^{-logx} = 8$

$3^{log2x} = \frac{1}{27}$

C12 - 8.6 - Word Problem Notes

How long to earn $2000 on $50000 at 8%/year?

How long to double your money at 5%/year?

How long to grow $100 to $2000 compounded semi-annually at 6%?

An earthquake of magnitude 7 is 300 times as intense as an earth quake of what magnitude?

How long to grow 500 Bacteria to 10000 at a continuous growth rate of 0.07?

Find the half-life of a substance decaying to 15% of its original in 80 years?

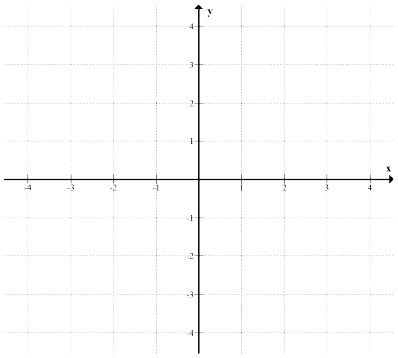
A substance has a half-life of 8 years. How long to be twenty percent of its original?

C12 - 8.7 - Graph Log HMK

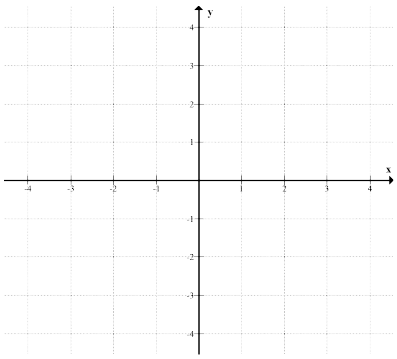
Graph and state Vertical Asymptote and Domain

$y = \log_2 x$

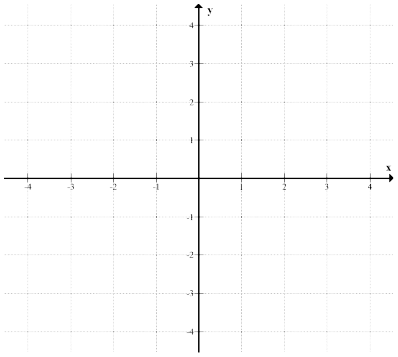
x	y



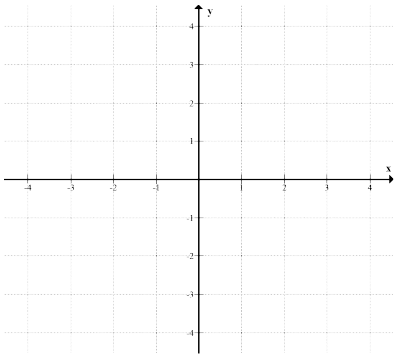
$y = \log_3 x$



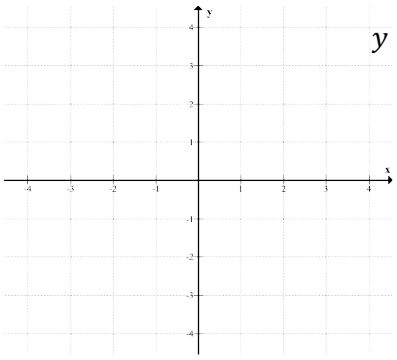
$y = \log_2 x + 1$



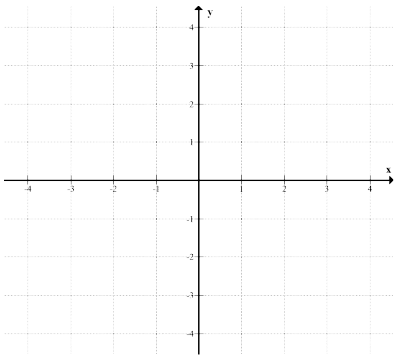
$y = \log_3(1 - x)$



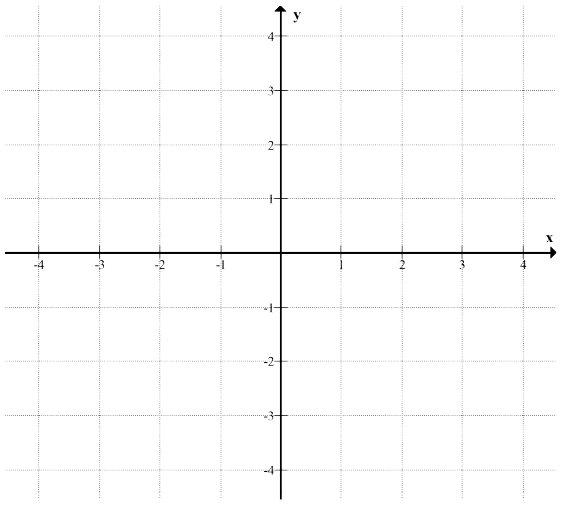
$y = -\log_2 x$



$y = 2\log_3(x + 2) - 3$



$y = -\log_3(2x + 2)) + 1$



C12 - 8.8 - Find Inverse HW

Determine the inverse of the following

$y = 8^x$

$y = 10^{x-2}$

$y = 5^{2x}$

$y = 3^{x+3}$

$y = 6^x + 7$

$y = 2^{2x-3} - 5$

$y = \log_4 x$

$y = \log_5(2x + 2)$

$y = \log_2(x + 3)$

$y = 5 - \log_3 2x$

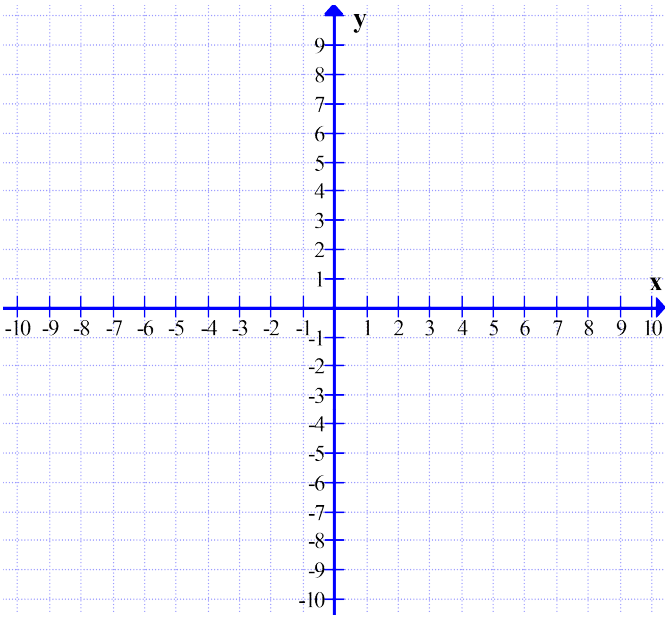
$2 + y = \log_2(x)$

C12 - 9.1 - Graph TOV HT VT xy-int HW

Graph. State VA's, HA's, x-int and y-int.

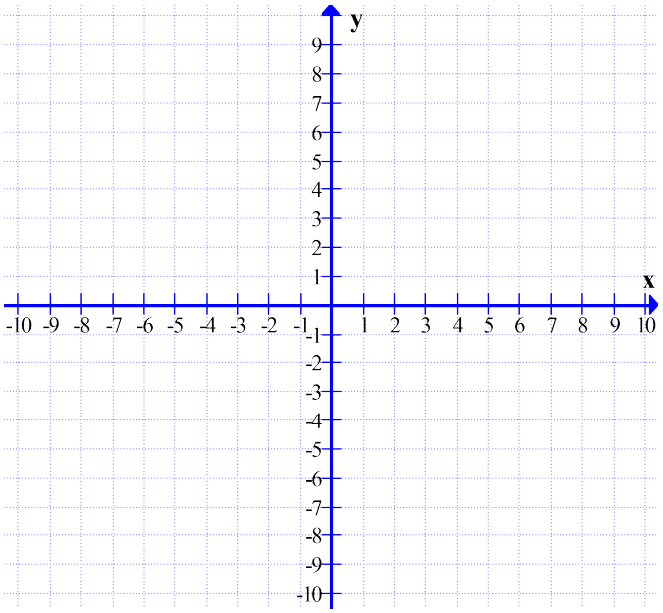
$y = \frac{1}{x}$

x	y
-10	
-5	
1	
-0.9	
0	
0.1	
1	
5	
10	



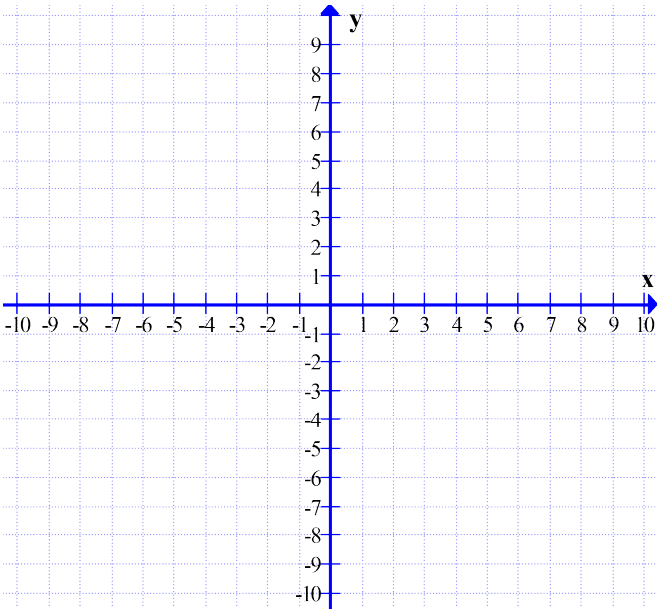
$y = \frac{1}{x} + 1$

x	y
-10	
-5	
1	
-0.9	
0	
0.1	
1	
5	
10	

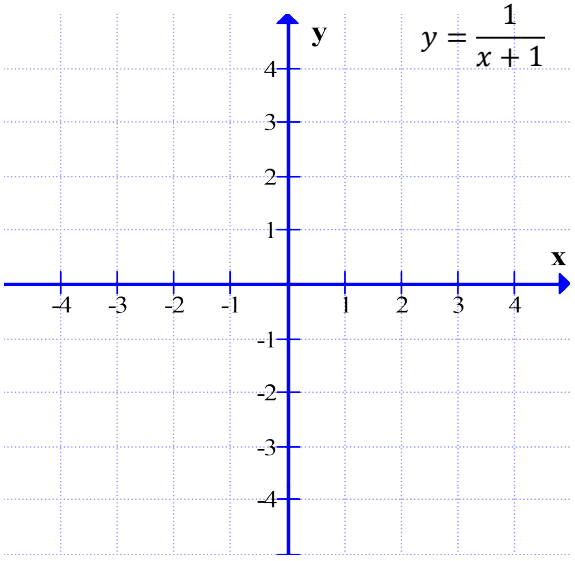


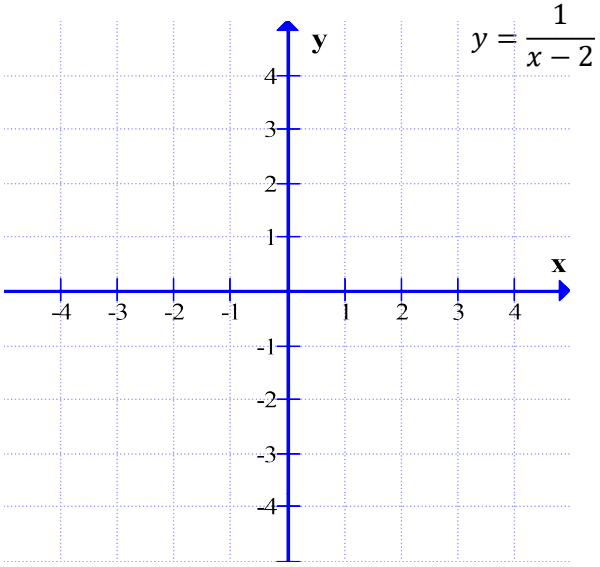
$y = \frac{1}{x-2}$

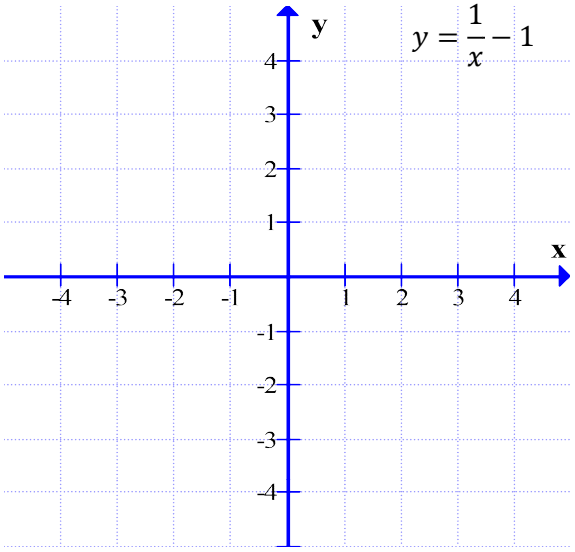
x	y
-10	
-5	
1	
1.9	
2	
2.1	
3	
5	
10	

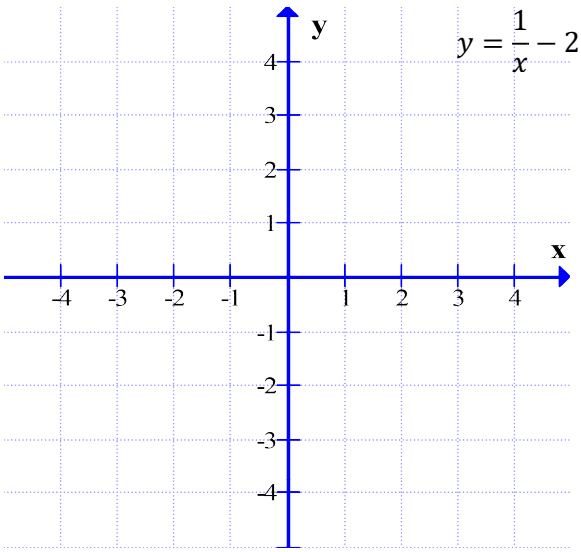


C12 - 9.1 - Graphs HT VT xy-int HW



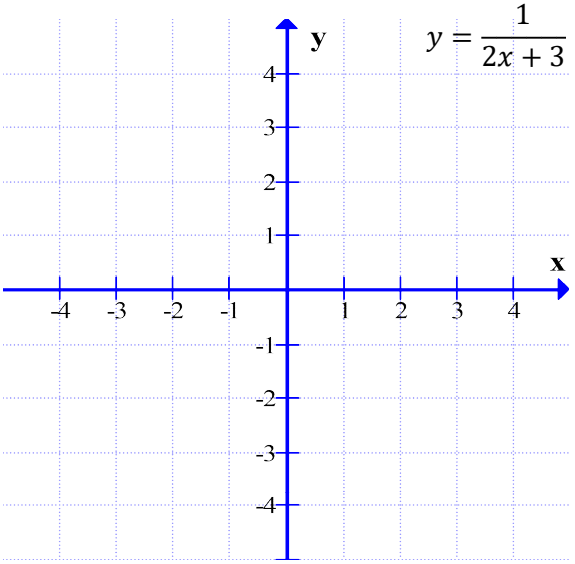




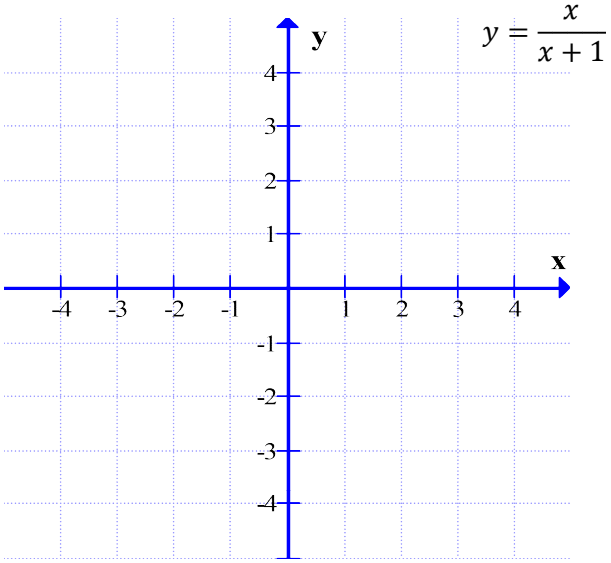


C12 - 9.1 - Graphs HT VT xy-int HW

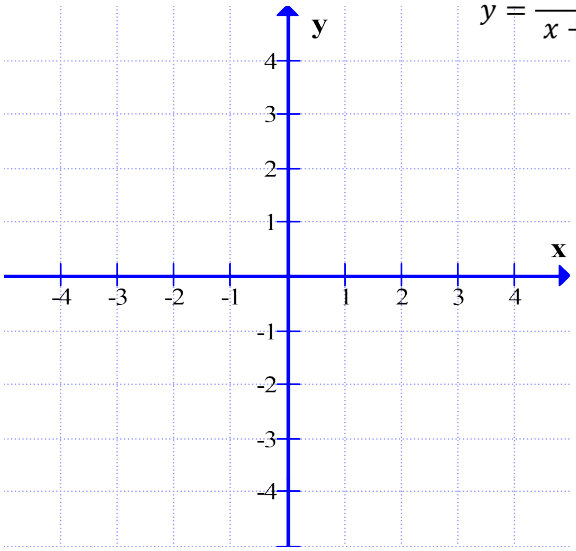
$y = \dfrac{1}{2x+3}$



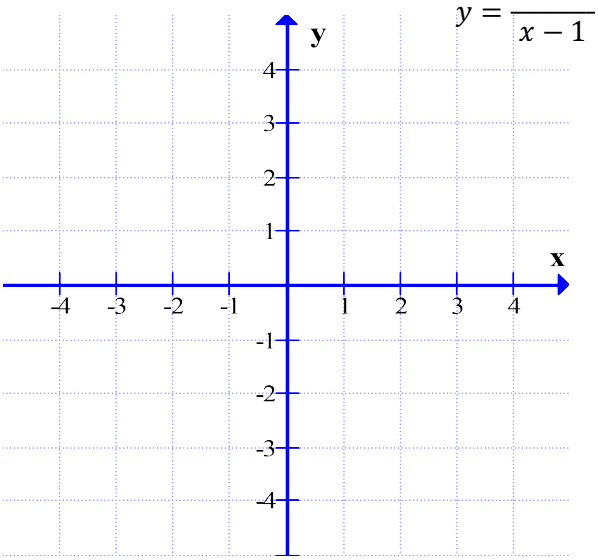
$y = \dfrac{x}{x+1}$



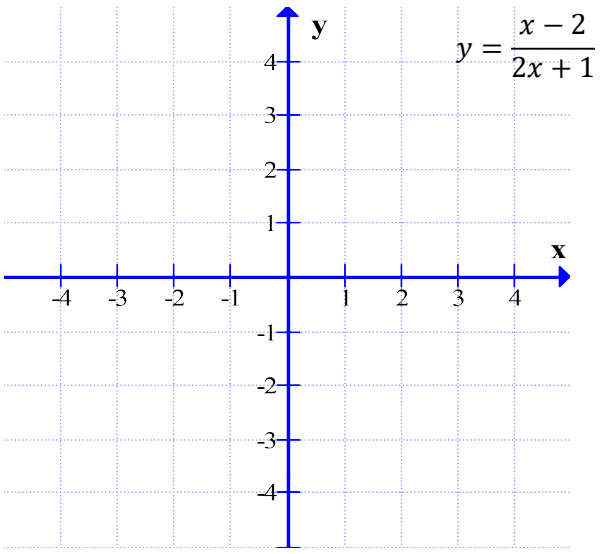
$y = \dfrac{2x-1}{x+2}$

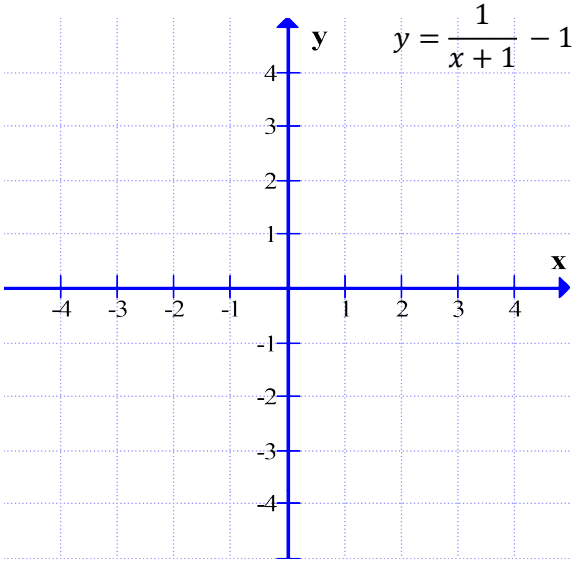


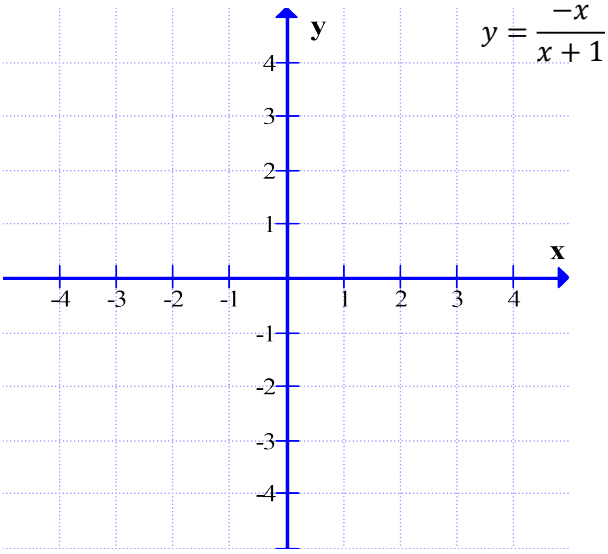
$y = \dfrac{3x+1}{x-1}$

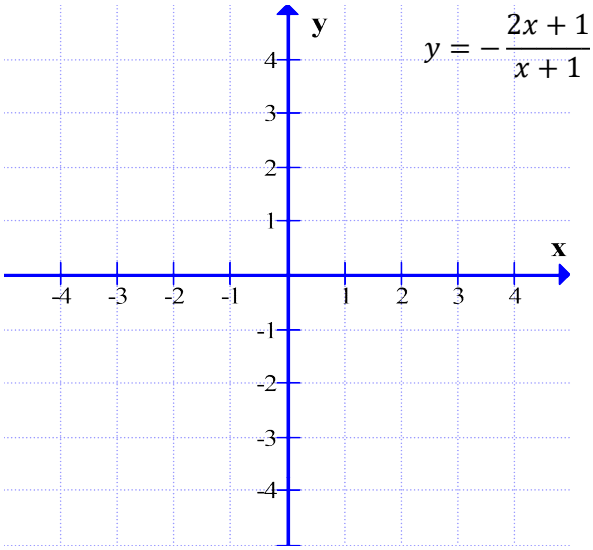


C12 - 9.1 - Graphs HT VT xy-int HW





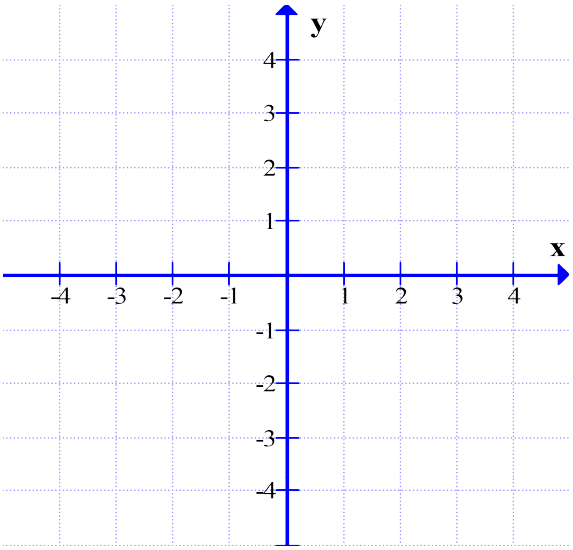




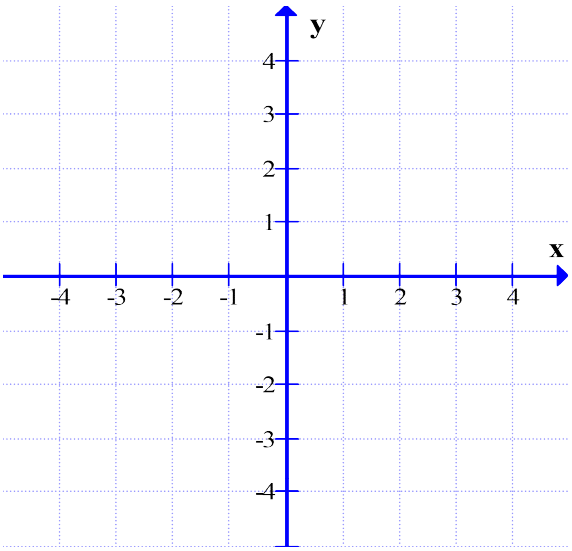
C12 - 9.2 - Graph VT Add Fractions HW

Add Fractions

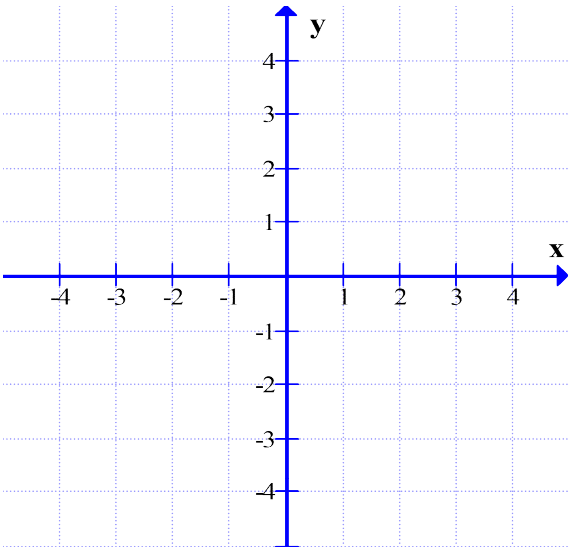
$y = \frac{1}{x} - 1$



$y = \frac{1}{x} - 2$



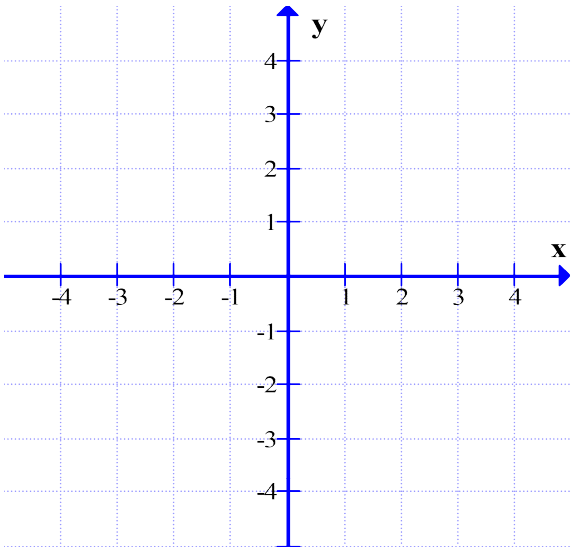
$y = \frac{1}{x-2} - 1$



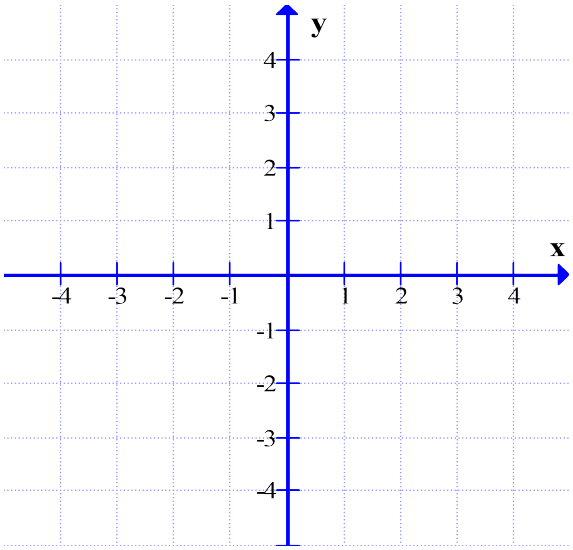
C12 - 9.2 - Graph VT Long Division HW

Do Long Division

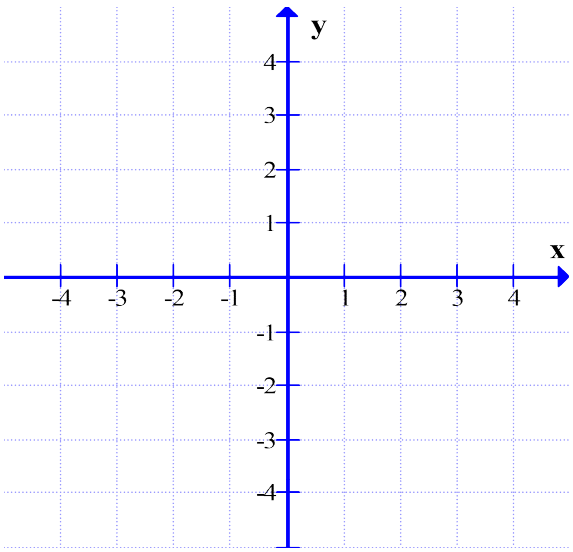
$y = \frac{1 - x}{x}$



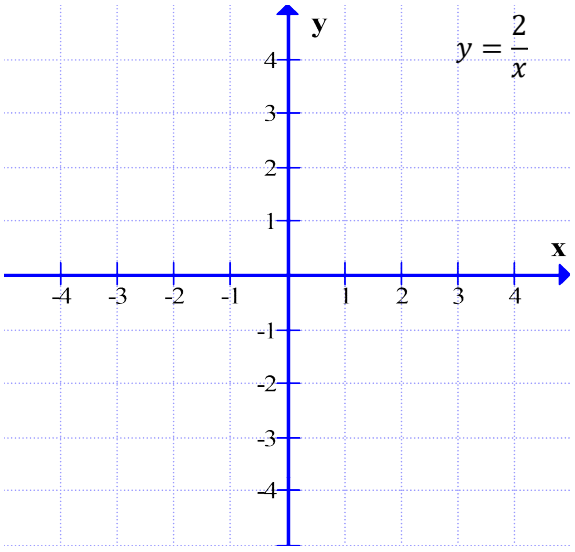
$y = \frac{1 - 2x}{x}$

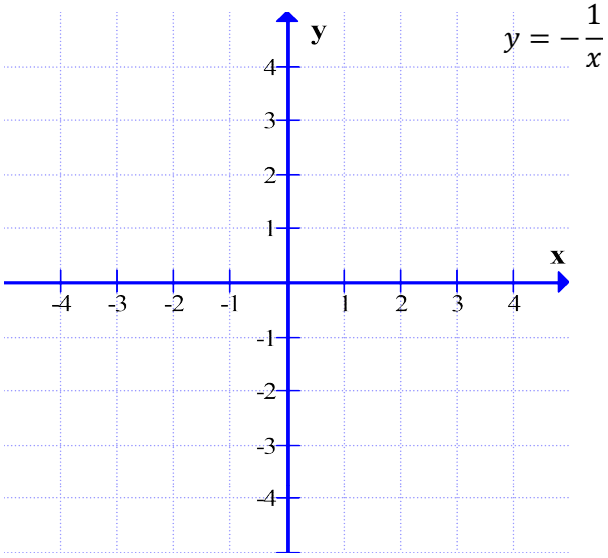


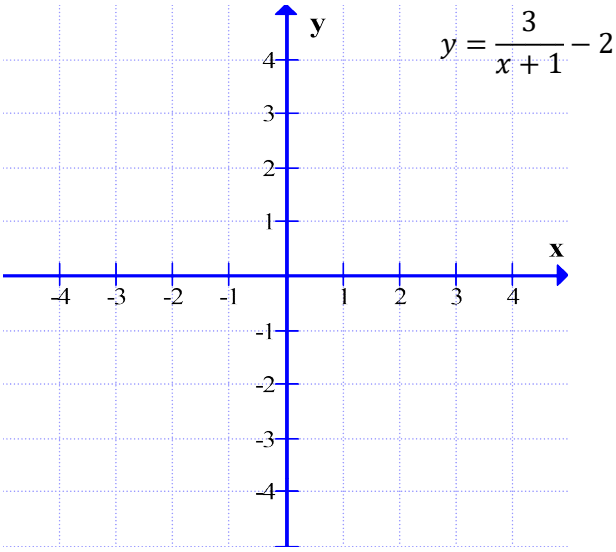
$y = \frac{2 - x}{x - 2}$

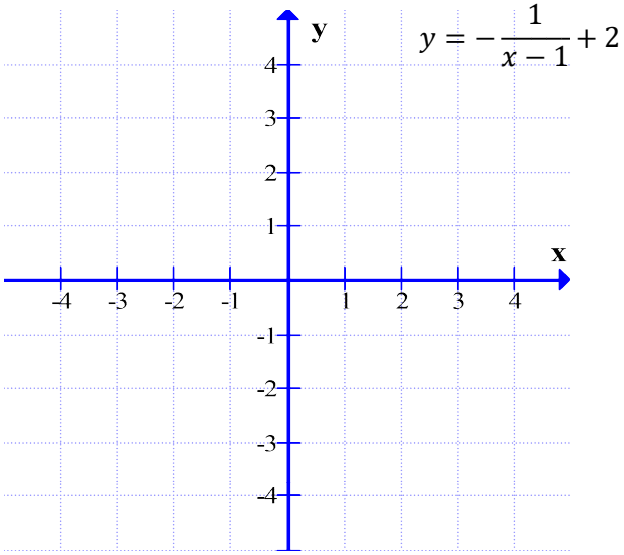


C12 - 9.3 - Graphs VE VR HW



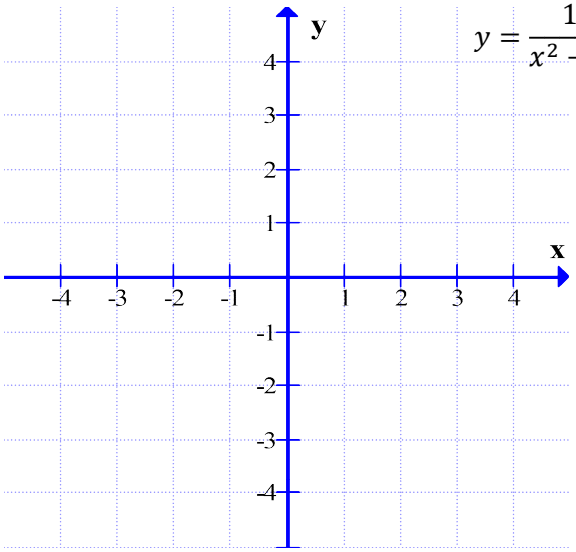




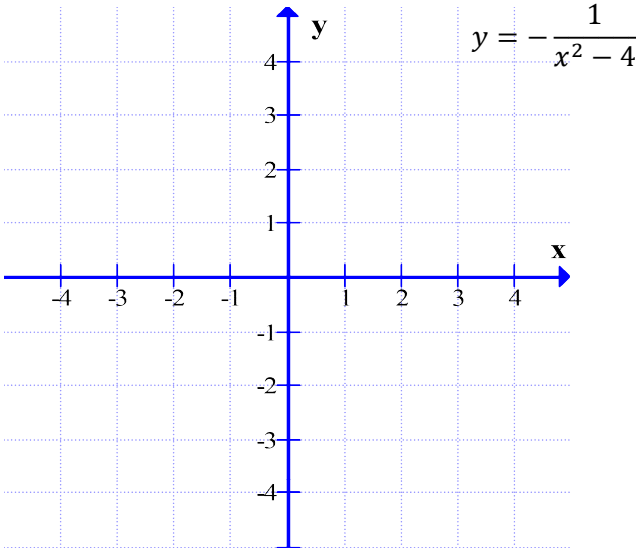


C12 - 9.4 - Graphs 2VA's HW

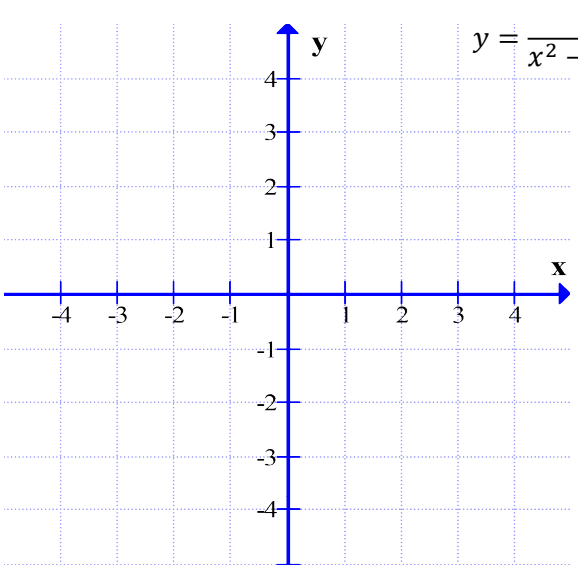
$y = \frac{1}{x^2 - 9}$



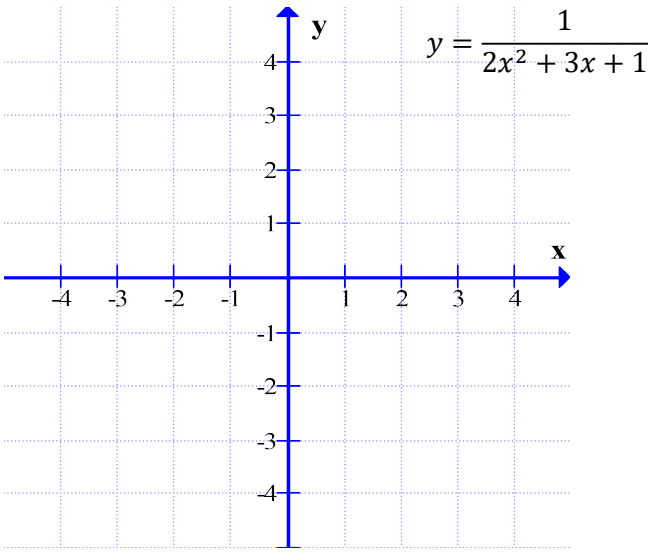
$y = -\frac{1}{x^2 - 4}$



$y = \frac{1}{x^2 - 2x - 8}$

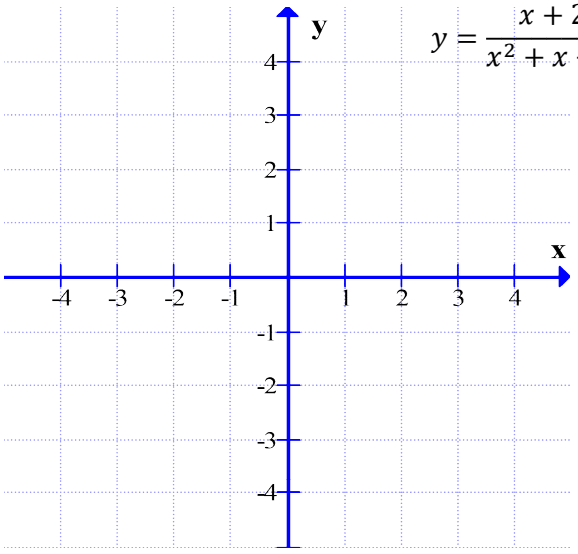


$y = \frac{1}{2x^2 + 3x + 1}$

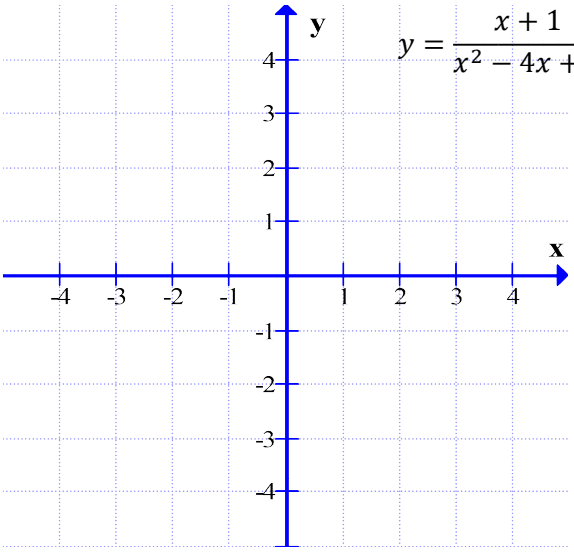


C12 - 9.5 - Graphs Holes HW

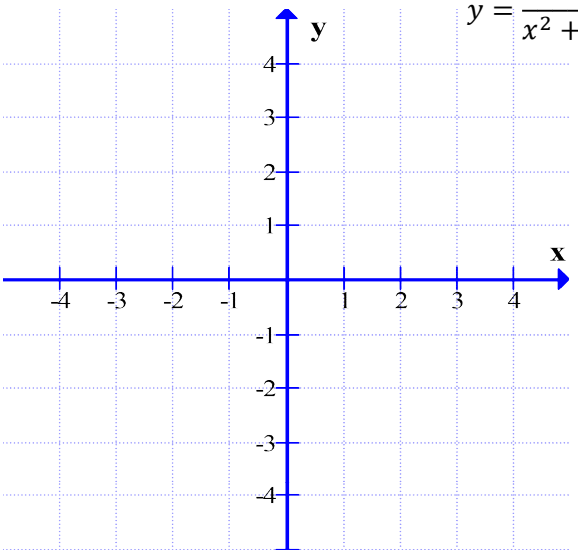
$y = \dfrac{x+2}{x^2+x-2}$



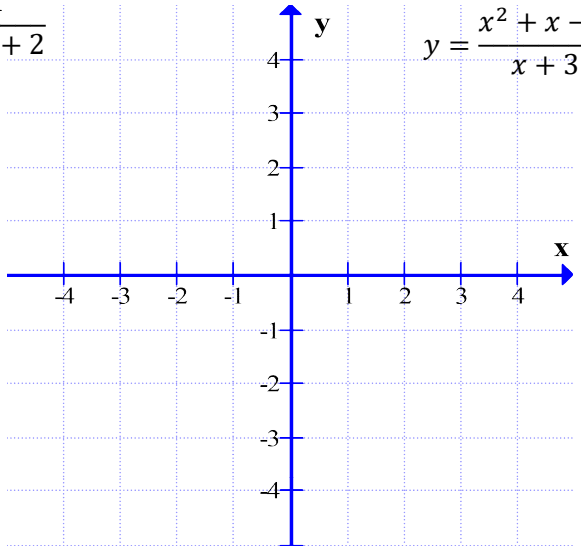
$y = \dfrac{x+1}{x^2-4x+3}$



$y = \dfrac{x+1}{x^2+3x+2}$

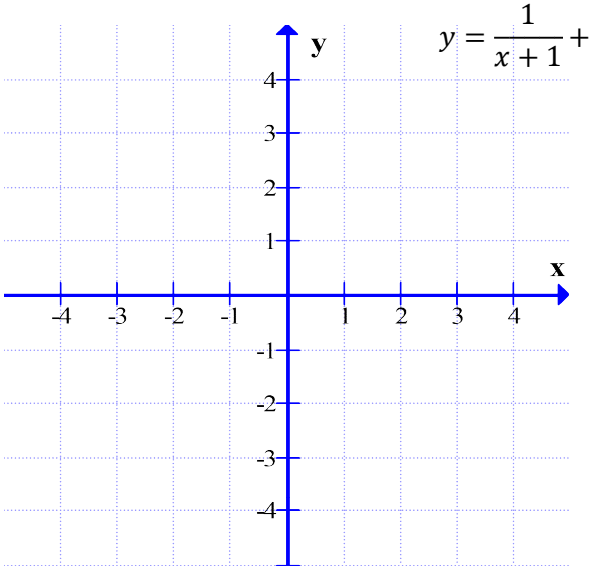


$y = \dfrac{x^2+x-6}{x+3}$

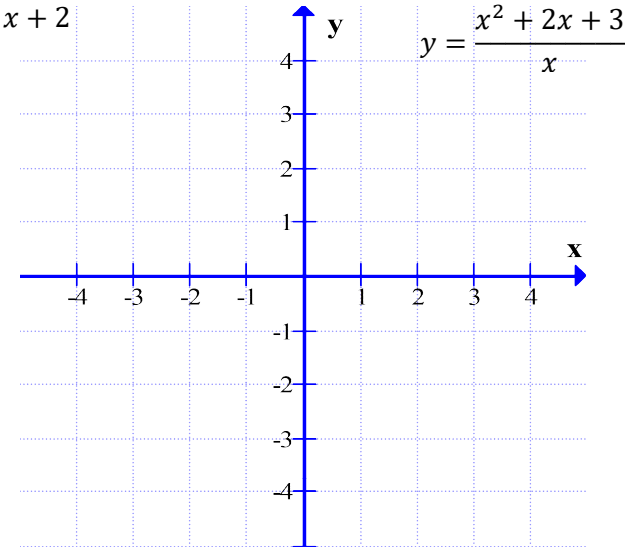


C12 - 9.6 - Graphs Slant HW

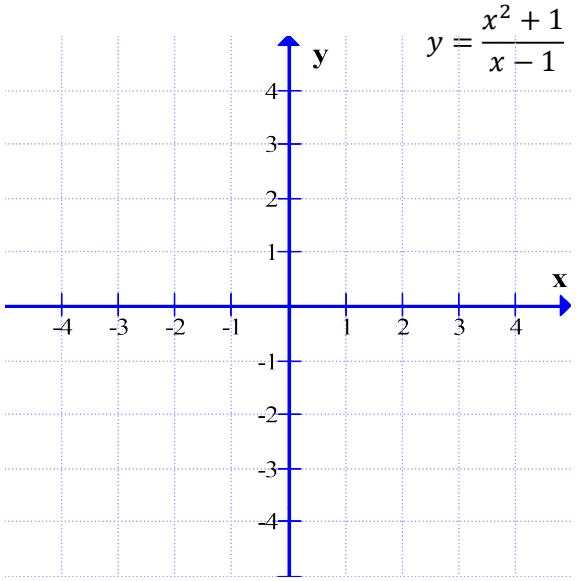
$y = \frac{1}{x+1} + x + 2$



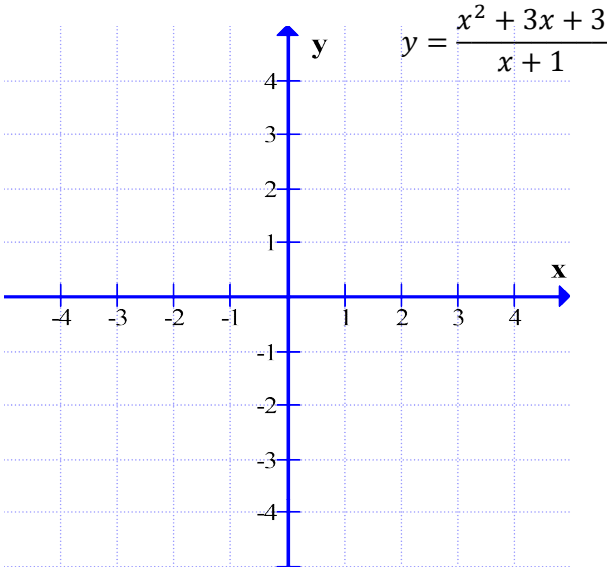
$y = \frac{x^2 + 2x + 3}{x}$



$y = \frac{x^2 + 1}{x - 1}$

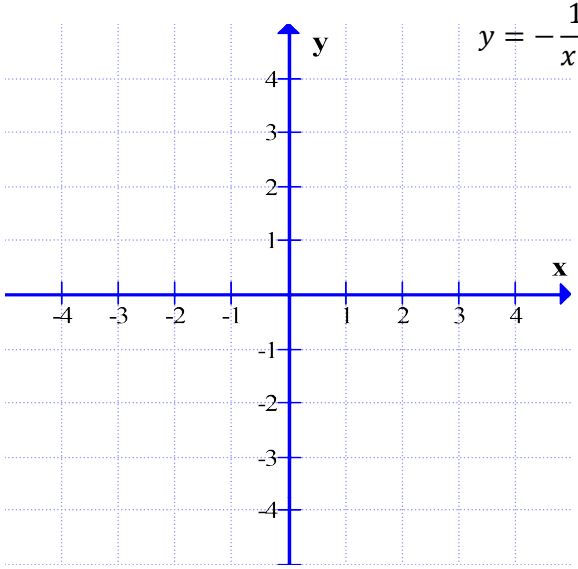


$y = \frac{x^2 + 3x + 3}{x + 1}$

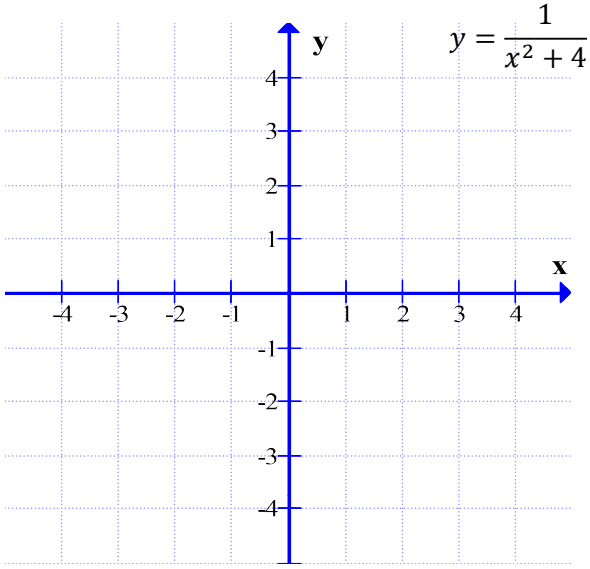


C12 - 9.6 - Graphs Mounds/Volcanoes HW

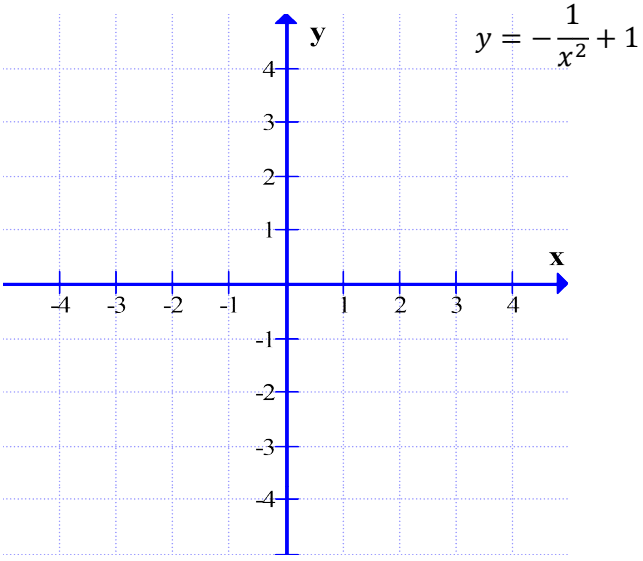
$y = -\frac{1}{x^2}$



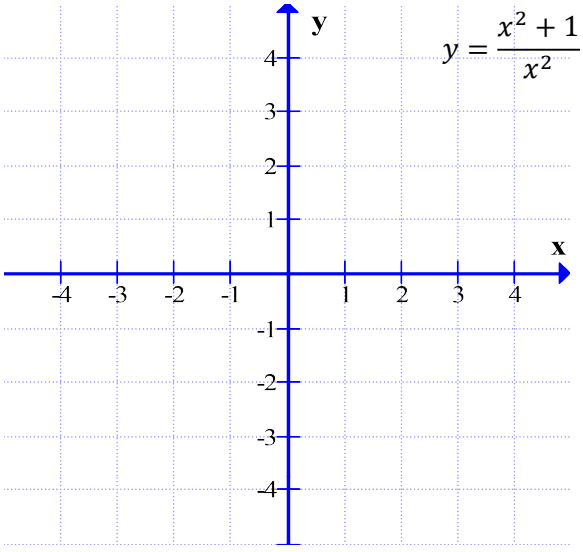
$y = \frac{1}{x^2 + 4}$



$y = -\frac{1}{x^2} + 1$

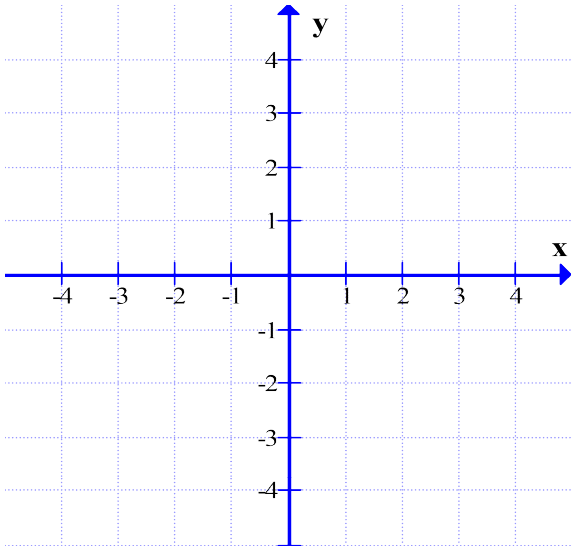


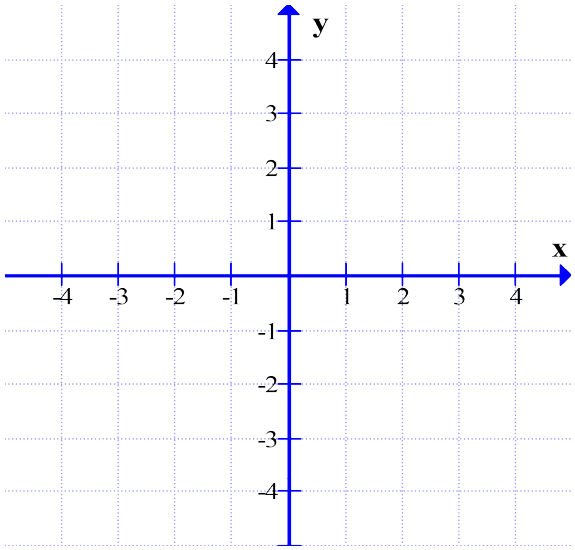
$y = \frac{x^2 + 1}{x^2}$

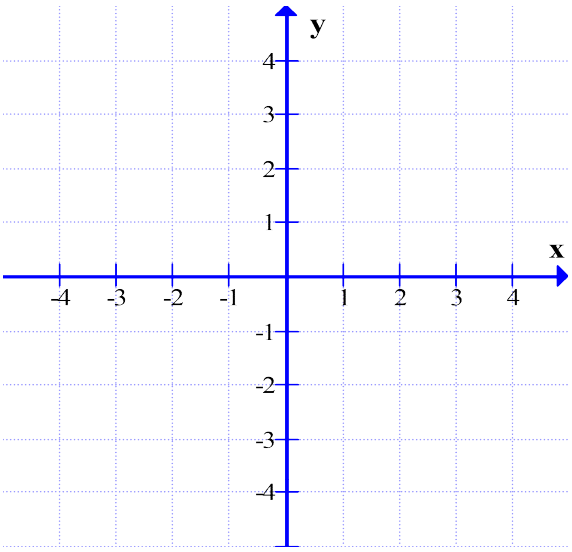


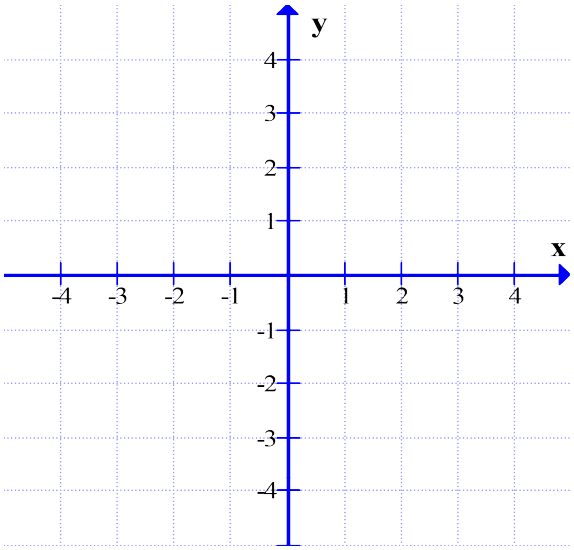
C12 - 9.7 - Find Equation HW

Draw a Graph from before and find the equation!



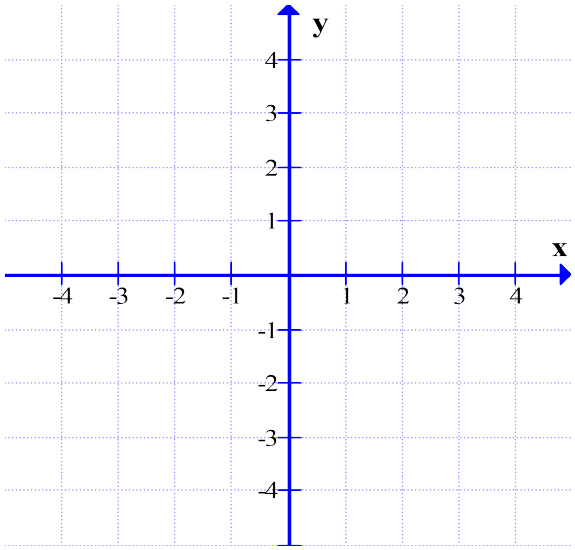


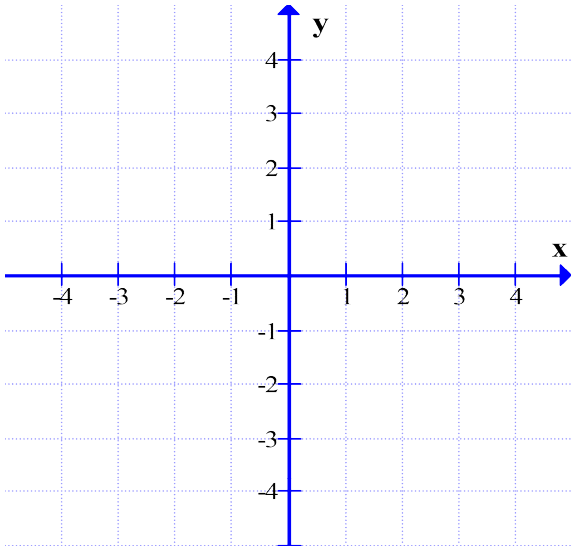


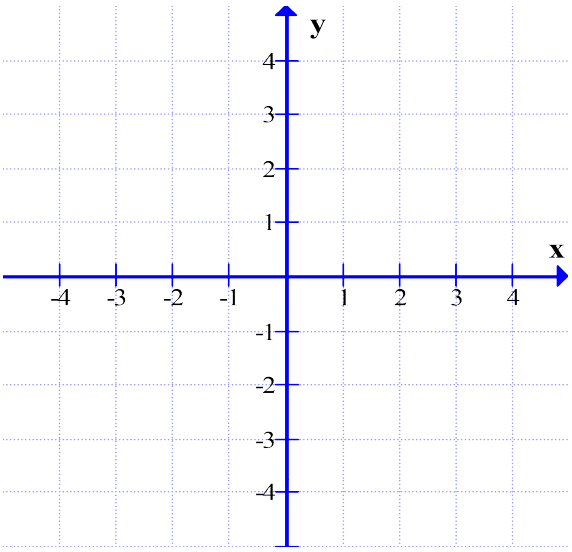


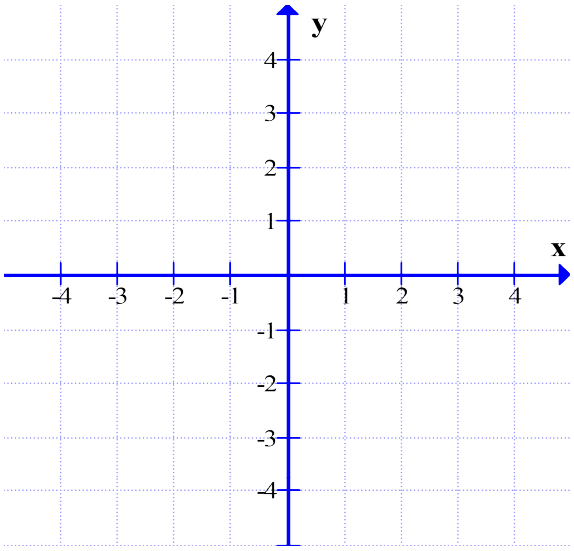
C12 - 9.7 - Find Equation HW

Make Up a graph!









C12 - 9.8 - Graph Review

Graph TOV. State VA's, HA's, x-int and y-int.

$y = \frac{1}{x+1}$ $y = \frac{1}{x-2}$ $y = \frac{1}{x} - 1$ $y = \frac{1}{x} - 2$ $y = -\frac{2}{x}$ $y = -\frac{1}{x}$

$y = \frac{1}{2x+3}$ $y = \frac{1-x}{x}$ $y = \frac{1-2x}{x}$

$y = \frac{x}{x+1}$ $y = \frac{2x-1}{x+2}$ $y = \frac{3x+1}{x-1}$ $y = \frac{x-2}{2x+1}$

$y = \frac{1}{x+1} - 1$ $y = \frac{1}{x+1} - 2$ $y = \frac{2}{x-1} + 1$

$y = \frac{-x}{x+1}$ $y = -\frac{2x+1}{x+1}$ $y = \frac{x+1}{x-1}$

$y = \frac{1}{x^2-9}$ $y = -\frac{1}{x^2-4}$ $y = \frac{1}{x^2-2x-8}$ $y = \frac{1}{2x^2+3x+1}$

$y = \frac{x}{x^2+x-2}$ $y = \frac{x+1}{x^2-4x+3}$

$y = \frac{3x^2}{x^2+1}$

$y = \frac{x^2+x-6}{x+3}$ $y = \frac{x^2-x-2}{x+1}$ $y = \frac{x+1}{x^2+3x+2}$ $y = \frac{x+2}{x^2-x-6}$

$y = \frac{1}{x+1} + x + 2$

$y = \frac{x^2+3x+3}{x+1}$

$y = -\frac{1}{x^2} + 1$ $y = \frac{1}{x^2+4}$

$y = \frac{x^2+1}{x^2}$

C12 - 10.1 - Function Operations HW

$f(x) = x + 3$

$Find$:

$f(2) =$ $f(-5) =$ $f(x+2) =$ $f(2x) =$

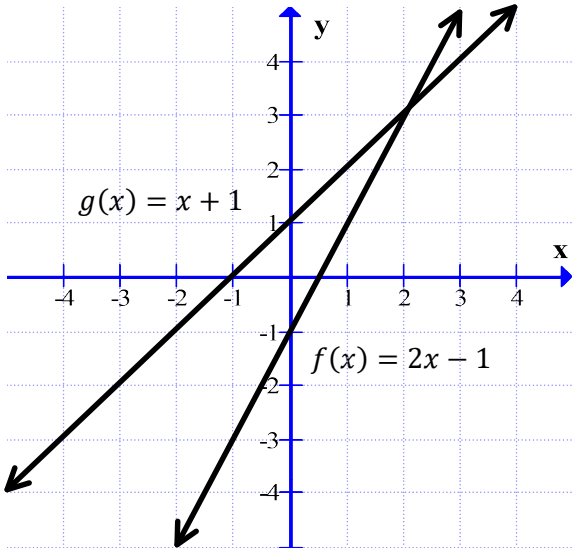
$g(x) = x^2$

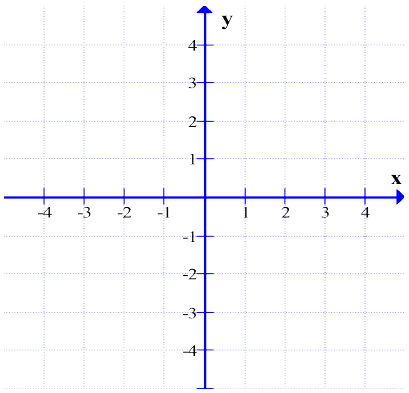
$g(2) =$ $g(-5) =$ $g(x+2) =$ $g(2x) =$

$m(x) = (x-2)^2 + 4$

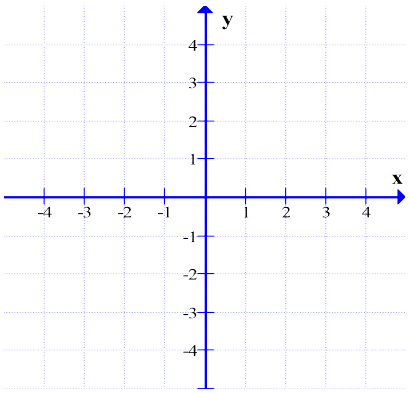
$m(2) =$ $m(-5) =$ $m(x+2) =$ $m(2x) =$

C12 - 10.1 - Operation Graphs HW

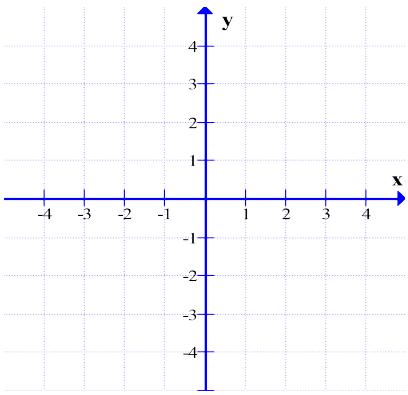




Find and Draw $f(x) + g(x)$

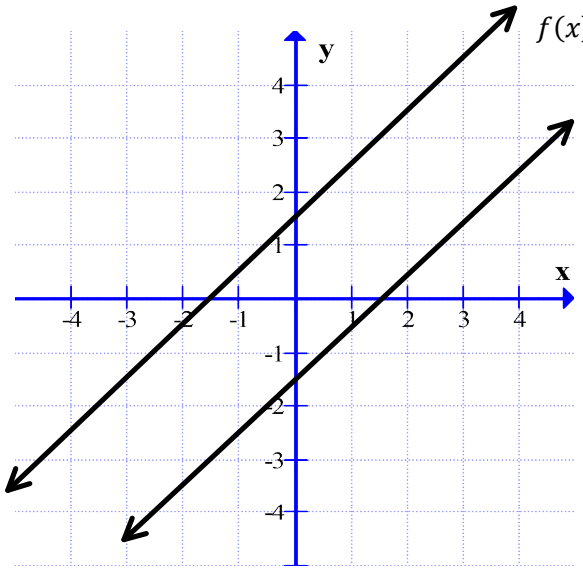


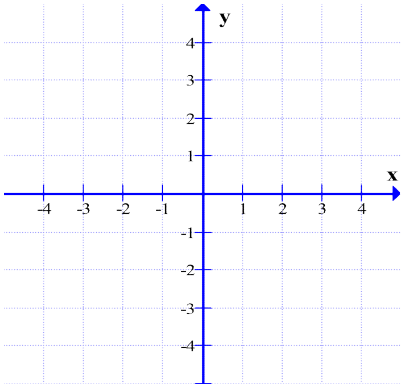
Find and Draw $f(x) - g(x)$



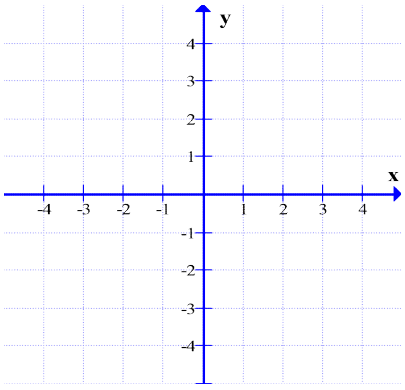
Find and Draw $f(x)g(x)$

C12 - 10.1 - Opreration Graphs HW

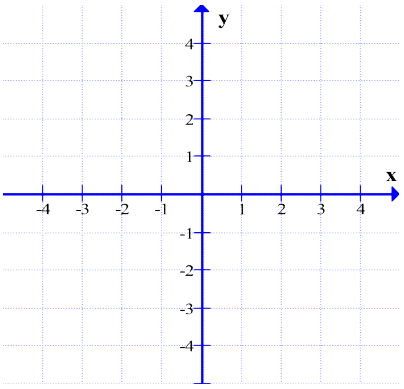




Find and Draw $f(x) + g(x)$

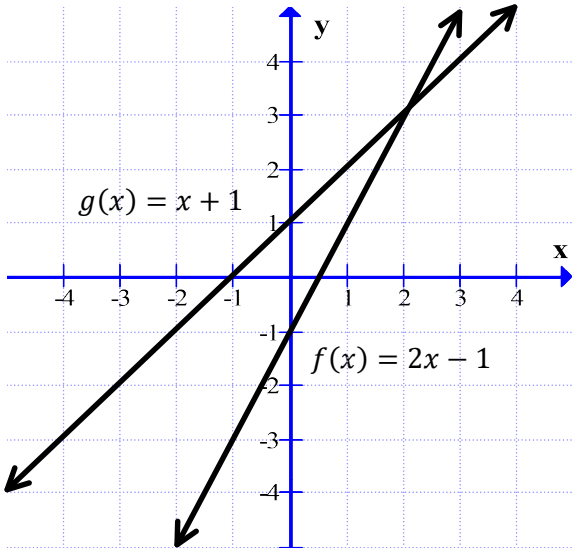


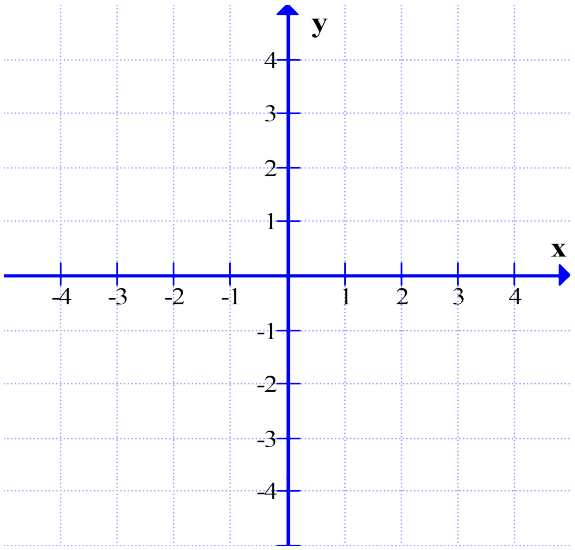
Find and Draw $f(x) - g(x)$



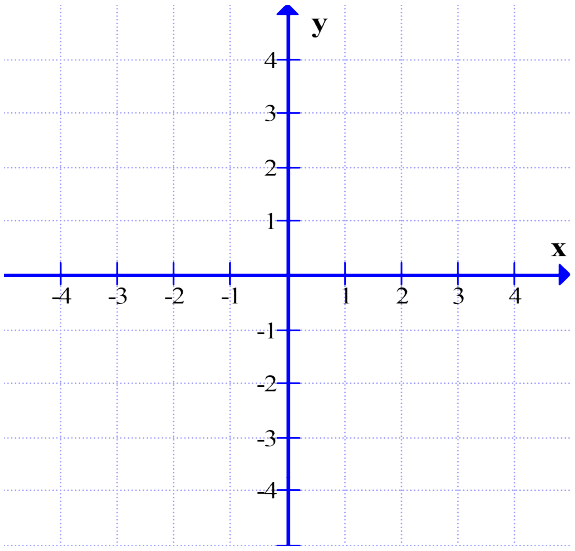
Find and Draw $f(x)g(x)$

C12 - 10.2 - Composite Graphs HW





Find and Draw $f(g(x))$



Find and Draw $g(f(x))$

C12 - 10.2 - Composite Functions HW

$f(x) = x + 1$ $g(x) = 3x$

Find:

$f(g(x)) =$ $g(f(x)) =$

$f(g(2)) =$ $g(f(x)) = 0$

$g(x) = (x - 1)$ $f(g(x)) = x^2 - 2x + 1$ $f(x) = ?$

$f(x) = (x - 1)$ $g(f(x)) = x^2 - 2x - 3$ $g(x) = ?$

C12 - 10.2 - Composite FoG HMK

$@(x) \neq 0,1, x \text{ or } @(x)$

Find $f(x)$ *and* $g(x)$ *if*: $h(x) = (x-1)^2 - 4$

$h(x) = f(x) + g(x)$

$h(x) = f(x) - g(x)$

$h(x) = f(x)g(x)$

$h(x) = f(g(x))$

Find $f(x)$ *and* $g(x)$ *if*: $h(x) = x^2 - 2x - 3$

$h(x) = f(g(x))$

$h(x) = 2x^2 - 6x - 8$

Note: Complete the square

Note: Factor

C12 - 11.1 - FCP HW

How many outfits can a person put together with two pairs of shoes, three pairs of pants, and five T-shirts?

How many outfits can a person put together with five pairs of shoes, six pairs of pants, and 99 T-shirts?

How many meals can a person make from three vegetables, five meats, and seven desserts?

How many meals can a person make from eight vegetables, 2 meats, and 12 desserts?

How many four digit numbers are there?

How many four digit even numbers are there?

How many six digit numbers are there?

How many six digit odd numbers are there?

C12 - 11.2 - Factorials WS

Right as a repeated multiplication at Solve.

$3! =$ $1! =$ $2! =$ $0! =$

$4! =$ $5! =$ $6! =$

$7! =$ $10! =$

$8! =$ $9! =$

Solve using your calculator

$14! =$ $32! =$

$54! =$ $17! =$

Solve

$3!\,2! =$ $3! + 2! =$

$\frac{3!}{2!} =$ $\frac{5!}{3!} =$

$\frac{100!}{97!}$ $\frac{9999!}{9998!} =$

$\frac{5!}{3!\,2!} =$ $\frac{3!}{5!\,2!} =$

$\frac{(n+1)!}{n!} =$ $\frac{(n+1)!}{(n-1)!} =$

$\frac{(n+2)!}{(n-1)!} =$ $\frac{n!}{(n-2)!} =$

C12 - 11.3 - $(outcomes\ per\ trial)^{\#\ of\ trials}$ Notes

If you flip a coin five times what is the total number of outcomes? Draw a tree diagram to confirm.

If a test has 20 true and false questions how many answer keys are possible?

If a test has A, B, C, D, E, and F multiple-choice answers with six questions how many answer keys are possible?

If a family has 9 children what is the number of combinations of boys and girls?

If you have ten lights in your house how many combinations of on and off are there?

If a person has 5 phones and each can be on vibrate, ring or silent how many combinations are there?

If a survey has good, bad, and unsure, with 5 questions how many ways can someone fill out the survey?

C12 - 11.4 - @βC 123 nPr, n!, nCr Notes

Write all solutions, and solve using factorials, combinations, and permutations

How many ways can you arrange the letters DEF with no repeats?

How many ways can you arrange the letters DEF with no restrictions (repeats allowed)?

How many ways can you arrange the letters DEF two at a time with no repeats?

How many ways can you arrange the letters DEF two at a time with no restrictions (repeats allowed)?

How many ways you arrange the digits 123 with no repeats?

How many ways can arrange the digits 123 with no restrictions (repeats allowed)?

How many ways can you arrange the digits 123 two at a time with no repeats?

How many ways can you arrange the digits 123 two at a time with no restrictions (repeats allowed)?

C12 - 11.4 - Cases 123 WS

Don't forget to write all the combinations!

How many three digit numbers can we make from the numbers 0,1,2 with no restrictions (repeats allowed)? 1 case.

How many three digit numbers can we make from the numbers 0,1,2 with no repeats? 1 case.

How many three digit even numbers can we make from the numbers 0,1,2 with no repeats?

How many three digit numbers can we with no restrictions? 1 case.

How many three digit numbers can we make with no repeats? 1 case.

How many three digit even numbers can we make with no repeats?

How many four digit numbers greater than 5300 can we make from the numbers 1,2,5,6?

C12 - 11.4 - President vs. Committee WS

How many ways can you select a committee of three people from 11 people?

How many ways can you select a committee of three people from five boys and six girls?

How many ways can you select a president, secretary, and treasurer from 11 people?

How many ways can you select a president, secretary, and treasurer of three people from five boys and six girls?

How many ways can you select a committee of three people with exactly 2 boys and a girl from five boys and six girls?

How many ways can you select a committee of three people with at least two girls, from five boys and six girls?

How many ways can you select a committee of three people with at least one girl, from five boys and six girls?

How many ways can you select a committee of six people with at least one boy, from 12 boys and 13 girls?

How many ways can you select a committee of 10 people with at least one girl, from 12 boys and 13 girls?

C12 - 11.4 - nPr nCr n! WS

Solve. Use blanks and repeated multiplication with factorial notation and combination and permutation notation where necessary. Practice both algebra and using your calculator.

How many ways can you select a captain from a team of nine players?

How many ways select a captain and a ball person from a team of nine players?

How many ways can you select three defenceman from a team of nine players?

How many ways can you select four mid-fielders from a team of nine players?

How many ways are there to select a 9 person batting order from a team of 13?

How many ways can you select nine players for the field from a team of 13?

How many ways can seven people sit in a row?

How many ways can five people sit in a row?

How many ways can seven people be chosen from 10 to sit in a row?

How many ways can five people be chosen from eight to sit in a row?

C12 - 11.4 - Identical Objects nPr nCr n! WS **No repeats**

Solve. List if under ten combinations.

How many different words can we make from the letters NOSE?

How many different words can we make from the letters SOON?

How many different words can we make from the letters TOTO?

How many different words can we make from the letters DID?

How many different words can we make from the letters MISSISSIPPI?

How many different words can we make from the letters STATISTICS?

How many words can we make from the letters ECONOMICS?

How many words can we make from the letters SUPERCALIFRAGILISTICEXPIALIDOCIOUS?

If you must walk 10 blocks east and 10 blocks south to get to school and you may only travel east and south, how many different ways can you walk to school?

C12 - 11.4 - nPr nCr n! Restrictions WS

Solve. Use blanks and repeated multiplication with factorial notation and combination and permutation notation where necessary. Practice both algebra and using your calculator.

How many ways can four boys and four girls sit in a row if?:

There are no restrictions:

All the girls must sit together, and all the boys must sit together?

Boys and girls must alternate:

The boys must be on the ends of the rows:

Matthew, a boy, must sit on the end:

Matthew, a boy, cannot sit on the end:

Note: No restrictions – Matthew must sit on the end!

Jacquelyn and Emily must sit together:

Jacquelyn and Emily cannot sit together:

How many ways can four boys and four girls sit in a circle if:

Remember: lock one person into a seat, and consider a row with one less person.

There are no restrictions:

All the girls must sit together, and all the boys must sit together?

Boys and girls must alternate:

The boys must be on the ends of the rows:

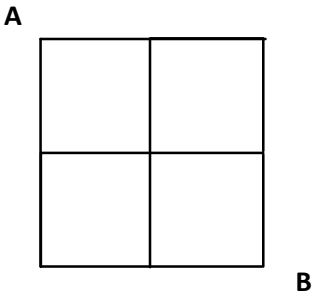
Jacquelyn and Emily must sit together:

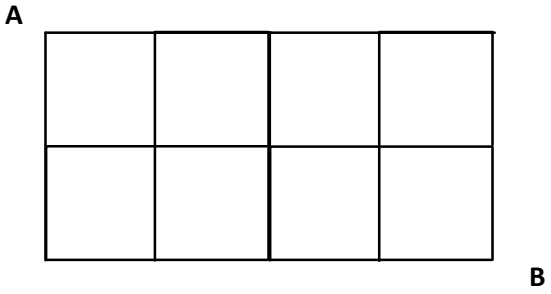
Jacquelyn and Emily cannot sit together:

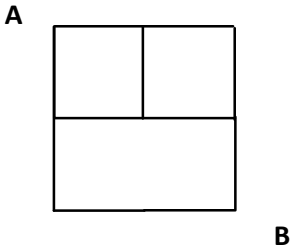
C12 - 11.4 - Paths in Squares HW

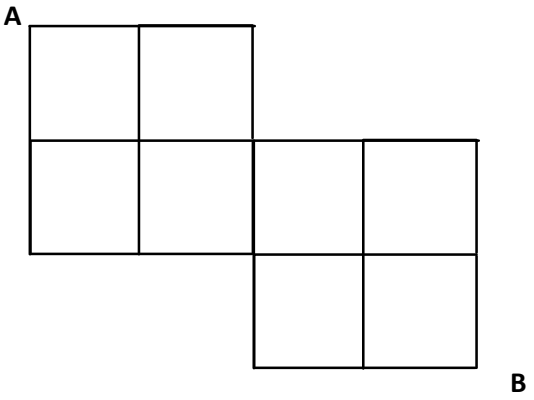
Pick a point, add points coming to it.

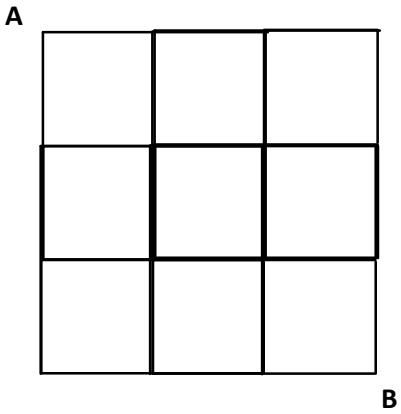
How many ways can you get from A to B if you may only travel east and south?

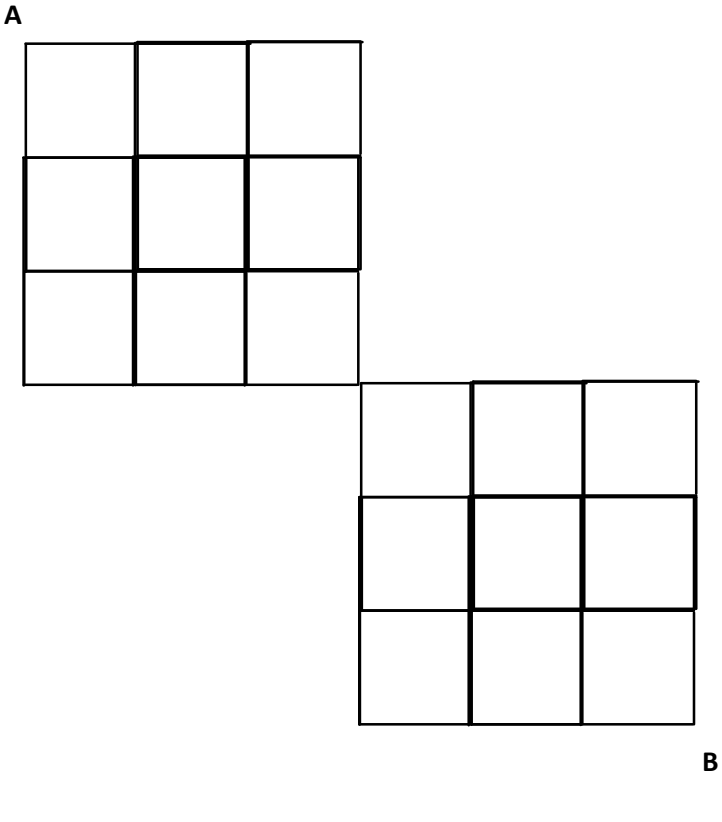


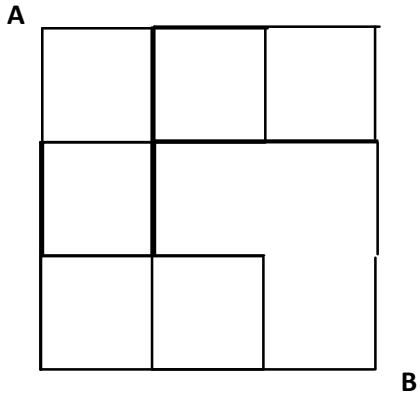












How many ways can you get from one corner of a four sided Rubik's cube to the opposite diagonal corner?

C12 - 11.4 - nPr nCr Algebra WS

Solve for the missing variable, *n*.

$\frac{n!}{(n-2)!} = 72$

${}_nC_2 = 6$

${}_nC_2 = 21$

${}_nP_2 = 42$

${}_nP_2 = 20$

${}_nC_3 = 10$

${}_nP_3 = 120$

${}_3C_r = 3$

C12 - 11.5 - Pascal's triangle HW

Draw the first seven rows of Pascal's triangle. Label the rows and columns with the appropriate "n" and "r" value. Replicate Pascal's triangle with the appropriate nCr notation.

C12 - 11.5 - Binomial Expansion HW

Expand using FOIL.

$(x+1)^2$

$(x+1)^3$

$(x-3)^2$

$(x-3)^3$

$(a+b)^2$

$(a+b)^3$

What do you notice about the coefficients of the last two examples and Pascal's triangle?

Expand using Pascal's Triangle

$(x+y)^2$

$(x+y)^3$

$(x+y)^4$

$(x+y)^5$

C12 - 11.5 - Binomial Theorem WS

How many terms are in the expansion:

$(x+y)^2$ $(x+y)^4$ $(x+y)^{99}$

What is the third term in the expansion of:

$(x+y)^5$ $(x+2)^5$

What is the fifth term in the expansion of:

$(x-3)^7$ $(x-2y)^8$

What is the 2nd term in the expansion of:

$(x^2+2)^5$

What is the term with x^2 in the expansion of:

$(x-3)^7$

What is the constant term in the expansion of:

$(x+2)^3$