Calculus 12 Homework

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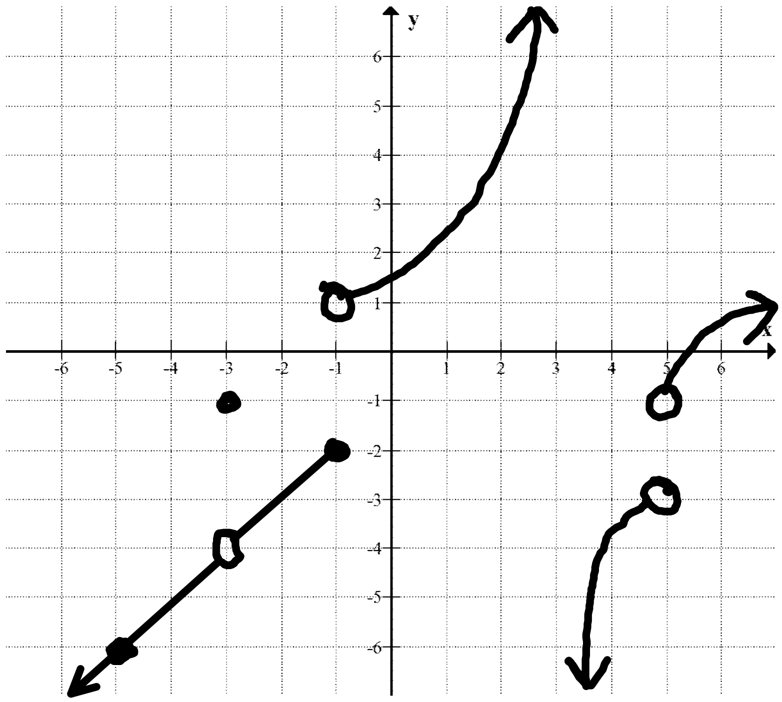
C12 - 1.1 - Limits Graph Hmk

Find the Limits. If all equal say Continuous.



$y = f(x)$

$\lim_{x\to -5^-} f(x) =$ $\lim_{x\to -5^+} f(x) =$ $\lim_{x\to -5} f(x) =$ $f(-5) =$

Limit Exists/Limit DNE Continuous/Discontinuous

$\lim_{x\to -3^-} f(x) =$ $\lim_{x\to -3^+} f(x) =$ $\lim_{x\to -3} f(x) =$ $f(-3) =$

Limit Exists/Limit DNE Continuous/Discontinuous

$\lim_{x\to -1^-} f(x) =$ $\lim_{x\to -1^+} f(x) =$ $\lim_{x\to -1} f(x) =$ $f(-1) =$

$\lim_{x\to 3^-} f(x) =$ $\lim_{x\to 3^+} f(x) =$ $\lim_{x\to 3} f(x) =$ $f(3) =$

$\lim_{x\to 5^-} f(x) =$ $\lim_{x\to 5^+} f(x) =$ $\lim_{x\to 5} f(x) =$ $f(5) =$

C12 - 1.1 - Limits Equations Sub/FactWS

Find the Limits

$\lim_{x \to 3} x + 2 =$

$\lim_{x \to 5} 2x^2 + 1 =$

$\lim_{x \to -2} \frac{1}{x+2} =$

x	y
-100	
-2.1	
-2.01	
-2.001	
-2	
-1.999	
-1.99	
-1.9	
100	

$\lim_{x \to 3} \frac{x+3}{x^2-9} =$

x	y
-100	
2.9	
2.99	
2.999	
3	
3.001	
3.01	
3.1	
100	

$\lim_{x \to -3} \frac{x+3}{x^2-9} =$

$\lim_{x \to 0} \frac{1}{x^2} =$

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

$\lim_{x \to 2} \frac{x^3-8}{x-2} =$

$\lim_{x \to 4} \frac{x^3-16x}{x-4} =$

$\lim_{x \to \frac{1}{2}} \frac{2x^2+5x-3}{2x-1} =$

C12 - 1.2 - Limits Equations Conj/LCD WS

Find the Limits

$\lim_{x \to 16} \dfrac{\sqrt{x} - 4}{x - 16}$

$\lim_{x \to 6} \dfrac{\sqrt{x+3} - 3}{x - 6}$

$\lim_{x \to 0} \dfrac{\frac{1}{x+2} - \frac{1}{2}}{x}$ $\quad LCD = 2(x+2)$

$\lim_{x \to 0} \dfrac{\frac{1}{(x+2)^2} - \frac{1}{4}}{x}$

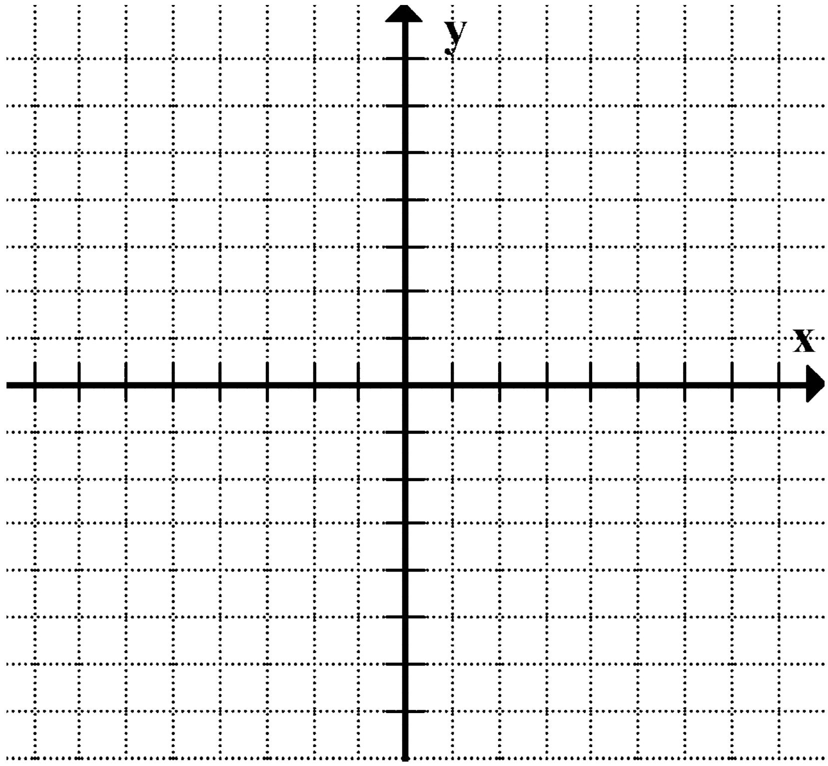
$\lim_{x \to 4} \dfrac{\frac{1}{\sqrt{x}} - \frac{1}{2}}{x - 4}$

$\lim_{x \to 16} \dfrac{x - 16}{4 - \sqrt{x}}$

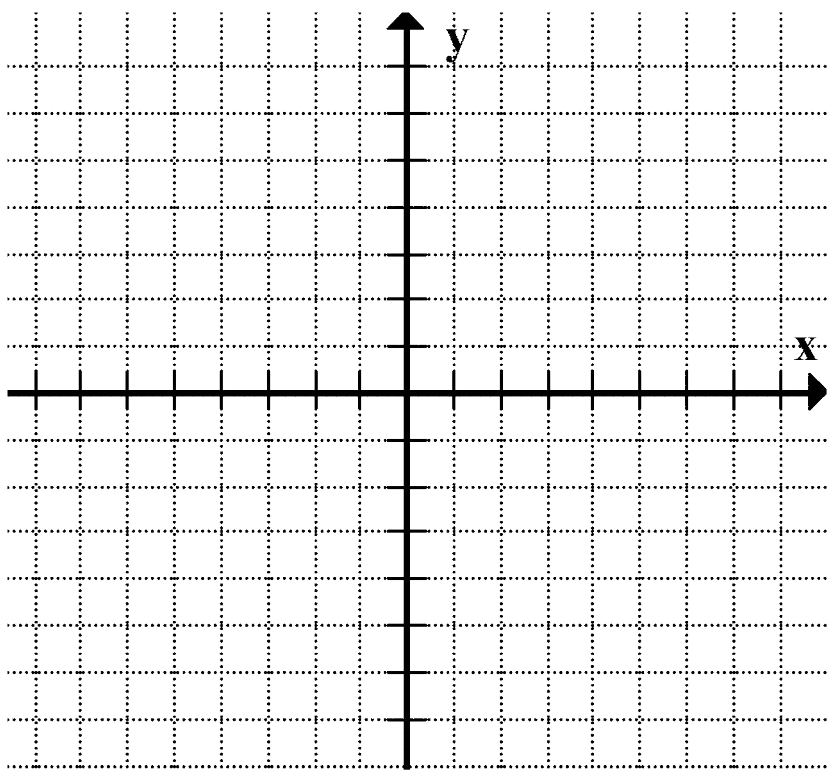
C12 - 1.3 - Vertical/Horizontal Asymptote HW

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

x	*y*
-10	
1	
1.9	
2	
2.1	
3	
10	



x	*Y*
-100	
-10	
-9	
-8	
2	
8	
9	
10	
100	



C12 - 1.3 - Vertical Asymptote Equations WS

Find the equation of the vertical asymptote.

$$\lim_{x \to 2^-} \frac{1}{x-2}$$

$$\lim_{x \to 2^+} \frac{1}{x-2}$$

$$\lim_{x \to 0^-} \frac{1}{x^2}$$

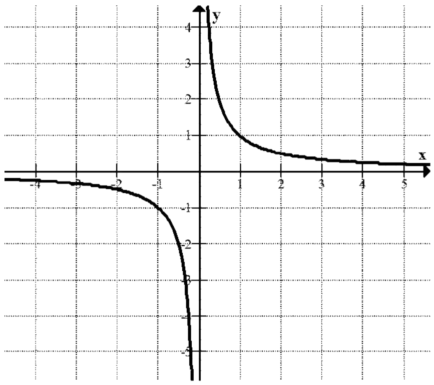
$$\lim_{x \to 0^+} \frac{1}{x^2}$$

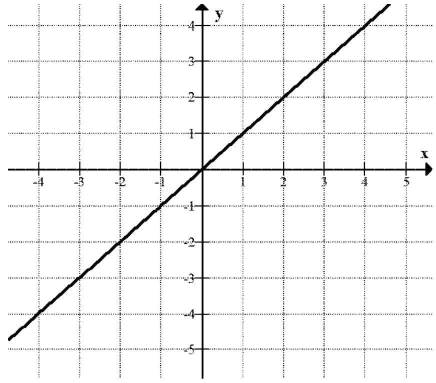
$$\lim_{x \to 0^-} \log x$$

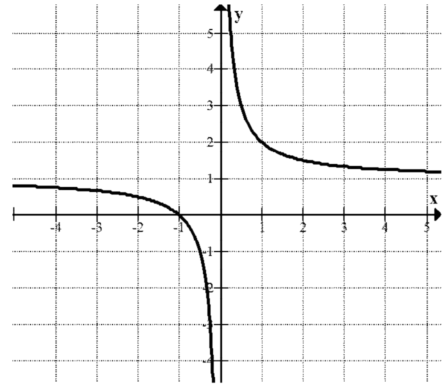
$$\lim_{x \to 0^+} \log x$$

C12 - 1.4 - Horizontal/Vertical Asymptote Graph HW

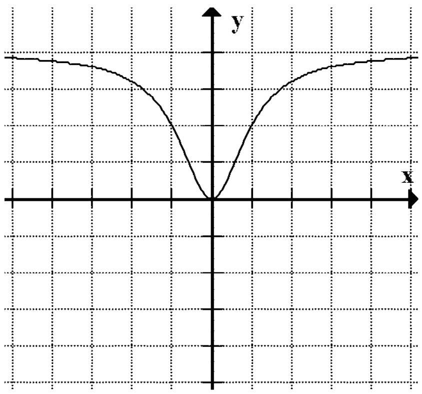
Find the equation of the Horizontal Asymptote

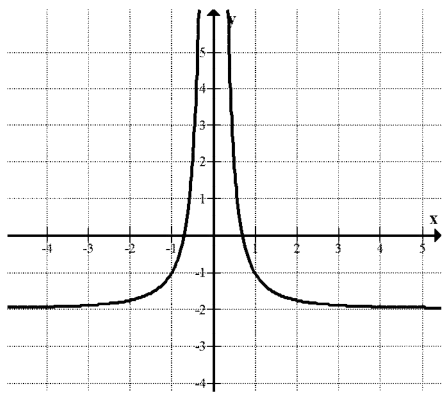


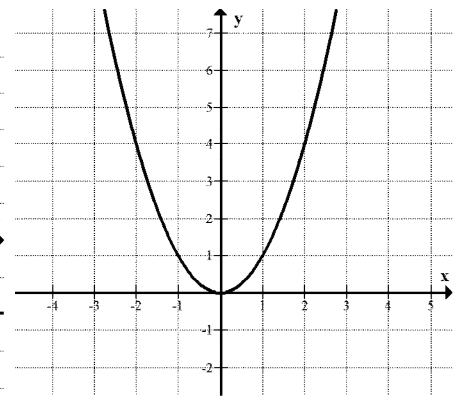




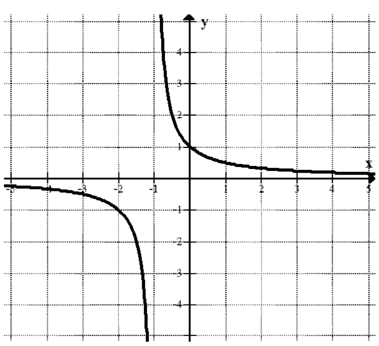
$y =$

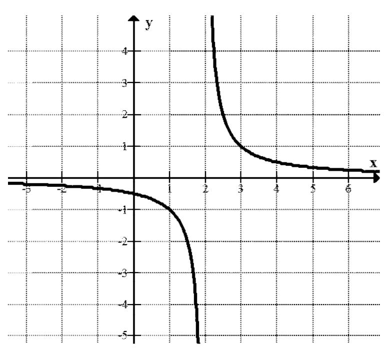


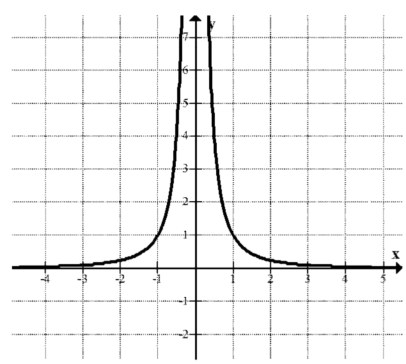




Find the equation of the Vertical Asymptote







$x =$

C12 - 1.4 - Horizontal Asymptote Equations WS

Find the equation of the horizontal asymptote. Divide top and bottom by highest exponent of x in denominator

$$\lim_{x \to \infty} \frac{x-1}{x^2+x}$$

$$\lim_{x \to -\infty} \frac{x+2}{x^2+x+1}$$

$$\lim_{x \to \infty} \frac{2x^2+2}{5x^2+x+1}$$

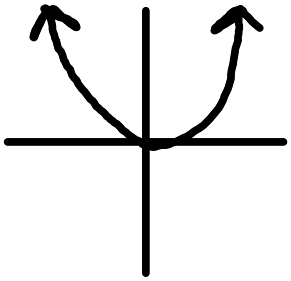
$$\lim_{x \to \infty} \frac{2x^3-1}{3x^2+1}$$

$$\lim_{x \to \infty} \frac{3x^2-1}{x-2}$$

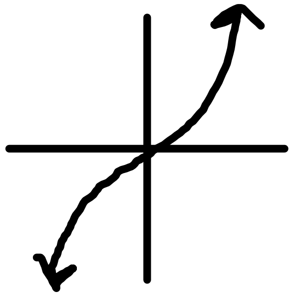
$$\lim_{x \to \infty} \frac{4x^3+2x}{x^2-5}$$

C12 - 1.5 - Even/Odd Functions Symmetry Hmk

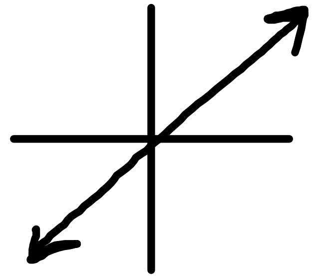
$Determine\ if\ the\ function\ is\ even, odd, or\ neither.$



$f(x) = x^2$



$f(x) = x^3$



$f(x) = x$

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

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

$f(x) = x + 1$

$f(x) = x^4$

$f(x) = \sqrt{x}$

$f(x) = \sqrt{x^2 + 2}$

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

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

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

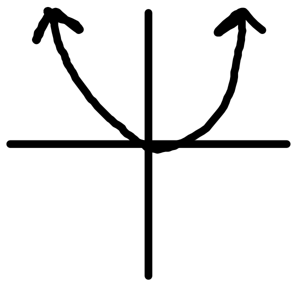
$f(x) = \frac{x^2}{x^2 + 1}$

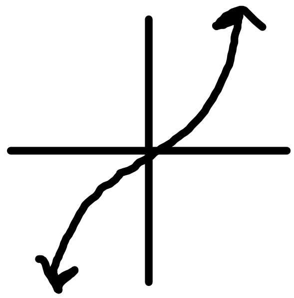
$f(x) = \frac{1}{x - 1}$

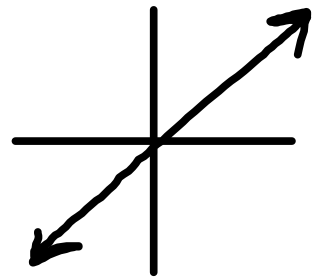
$f(x) = \frac{x^3}{x^2 - 1}$

C12 - 1.5 - One-to-One Functions Hmk

Determine if the function is one to one.







$f(x) = x^2$

$f(x) = x^3$

$f(x) = x$

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

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

$f(x) = x + 1$

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

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

$f(x) = -x^3$

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

$f(x) = e^x$

$f(x) = logx$

$f(x) = |\ x\ |$

$f(x) = sinx$

$f(x) = intx$

$$Slope = \frac{y_2 - y_1}{x_2 - x_1}$$

C12 - 2.1 - M8 Secant Slopes WS

Find the secant slopes for the following: Sketch a graph of each slope.

$y = x^2$; @ (1,1) *and*:

(2,4) (1.5,2.25) (1.1,1.21) (1.01,1.0201) (1.001,1.002001)

Estimate the tangent slope at (1,1)

Use the definition of the derivative to find the slope at (1,1)

Now use Power Rule.

Now find Equation of Tangent line at (1,1)

C12 - 2.2 - Definition of Derivative Equation Graph HMK

Find the derivative using the definition of the derivative.

$f(x) = 2x$

$y = x^2$

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

$f(x) = x^3$

C12 - 2.2 - Definition of Derivative Equation Graph HMK

Find the derivative using the definition of the derivative.

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

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

$f(x) = \sqrt{x}$

$f(x) = \frac{1}{\sqrt{x}}$

C12 - 2.3 - Power Rule Derivatives HMK

Find the derivative using the power rule

$y = x^2$

$f(x) = 5$

$y = x^3$

$y = 2x^2$

$y = x^{-2}$

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

$y = 9^2$

$y = \sqrt{x}$

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

$y = 2x^{\frac{1}{4}}$

$y = \sqrt{2}$

C12 - 2.3 - Power Rule Derivatives HMK

Find the derivative using the power rule

$y = x^2 + 2x$

$f(x) = 2\sqrt{x}$

$y = 5x^3 + 2x^2$

$y = x^3 - \sqrt{x}$

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

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

$y = \sqrt[3]{x}$

$y = \frac{5}{x^2}$

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

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

C12 - 2.3 - Product/Quotient Rule Derivatives

Find the derivative using the product rule

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

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

Find the derivative using the quotient rule

$y = \frac{3x}{x - 1}$

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

C12 - 2.3 - Chain Rule Derivatives

Find the derivative using the chain rule

$y = (3x + 2)^2$

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

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

$y = (2x + (x^2 + 1)^2)^3$

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

$$y = \frac{(2x^2 + 1)^3}{(2x + 2)^5}$$

$y = sin2x$

$y = \sin^2 x$

$y = \sqrt{x + sin2x}$

C12 - 2.5 - Implicit Differentiation HW

Find the derivative using implicit differentiation

$x^2 + y^2 = 9$

$x^3 - y^3 - 2 = 0$

$x^2 + xy = 2$

$x^2y^2 - 2x = 5$

$(xy + x)^2 = 5$

C12 - 2.7 - Equation of Tangent

Find the equation of the tangent line to the graph of the given function at the given point using both the definition of the derivative and the power rule. Sketch both graphs.

$x^2 - 1$; (1,0)

$\sqrt{x}$; $x = 4$

C12 - 2.7 - Equation of Tangent

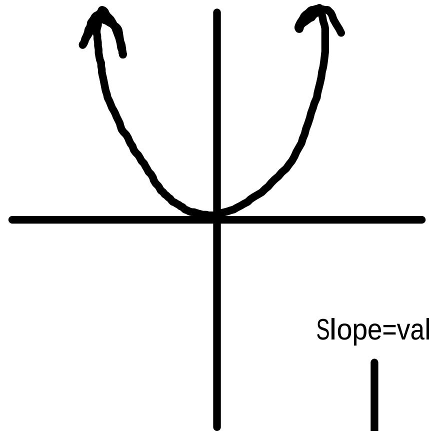
Find the equation of the tangent line to the graph of the given function at the given point using both the definition of the derivative and the power rule. Sketch both graphs.

$\frac{1}{x}$; $x = 1$

x^3 ; $x = -1$

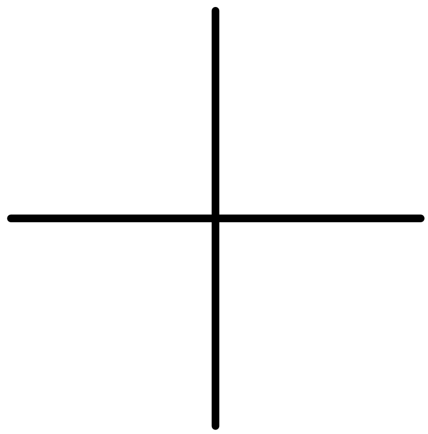
C12 - 2.6 - Graph derivatives and Reverse Hmk

$f(x) = x^2$

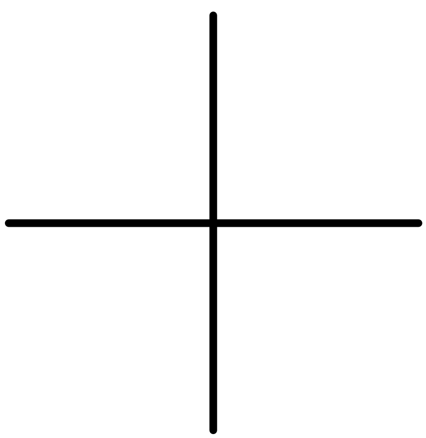


Slope=value

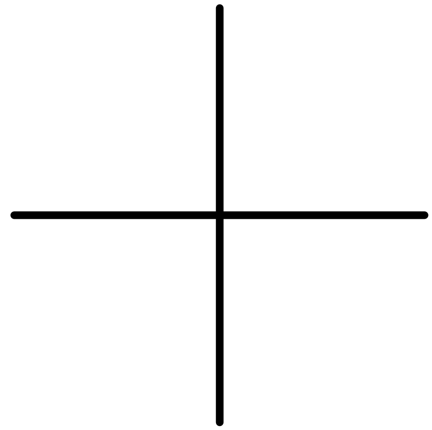
$f'(x) =$



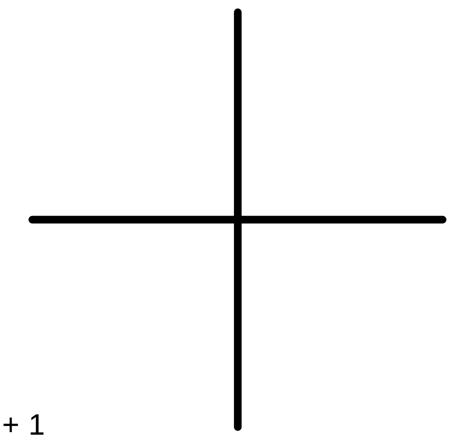
$f''(x) =$



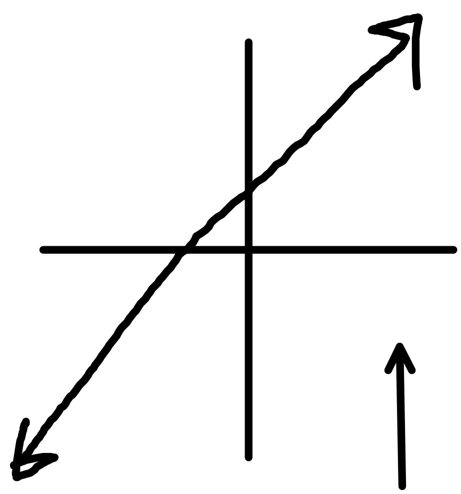
$f(x) =$



$f'(x) =$



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



value=slope

C12 - 3.12 - Critical/Inflection Points HW

Find the critical points. Find the derivative and set it equal to zero. Draw a graph and show the location of the horizontal slopes. Use a number line to show where the derivative and slope is positive and negative. Define the critical point as a maximum or a minimum. Find any Inflection Points and intervals of concavity.

$y = x^3 - 27x$

C12 - 3.12 - Critical/Inflection Points HW

Find the critical points. Find the derivative and set it equal to zero. Draw a graph and show the location of the horizontal slopes. Use a number line to show where the derivative and slope is positive and negative. Define the critical point as a maximum or a minimum. Find any Inflection Points and intervals of concavity.

$y = x^3 - 5x^2 - 8x$

C12 - 4.1 - Circle/Sphere Related Rates HMK

The radius of the circle is growing at 4 m/s. What is the rate at which the area of the circle is changing when the radius is 10 m and 20m.

The radius of the sphere is growing at 3 m/s. What is the rate at which the volume of the sphere is changing when the radius is 10 m.

C12 - 4.1 - Square/Cube Related Rates HMK

The side of the square is growing at 2 cm/s. What is the rate at which the area of the square is changing when the side is 8 cm.

The side of the cube is growing at 3 m/s. What is the rate at which the volume of the cube is changing when the side is 2 m.

C12 - 4.1 - Square/Cube Related Rates HMK

The area of the square is growing at 7 cm squared per second. What is the rate at which the side length of the square is changing when the side is 14 cm.

The volume of the cube is growing at 3 meters cubes per second. What is the rate at which the volume of the cube is changing when the side is 2 m.

C12 - 4.2 - Train Pythag Related Rates HMK

Train 'a' leaves Vancouver heading North at 8 m/s and train 'b' leaves heading West at 6 m/s? How far are they a part after 5 minutes? What is the speed at which the trains are moving apart at that time?

Train 'a' leaves Whistler, 100 km North of Vancouver, heading South at 12 m/s and train 'b' leaves Vancouver heading West at 9 m/s? How far are they a part after 5 minutes? What is the speed at which the trains are moving apart at that time?

C12 - 4.2 - Ladder Pythag Related rates HMK

The top of a 20 ft ladder slides down a wall at a rate of 2 ft/s. At what rate is the base of the ladder sliding away from the wall when the latter is at a height of 6 ft on the wall.

What is the rate the angle at the bottom of the ladder changing?

C12 - 4.2 - Similar Triangles/Cos Law Related Rates Notes

At 6 foot tall man is walking away from a 30 foot lamp post at 2 m/s. What is the rate of change in the size of his shadow when he is 50 feet from the lamp post; and is his shadow getting bigger or smaller.

A float plane rising at 45° above the horizontal flies over a boat at an altitude of 200 m at 80 m/s. How fast is the distance between the boat and the plane increasing after five seconds?

C12 - 4.3 - Cone/Sim Tri/Cos Law Related Rates Notes

A cone with a radius of 4 cm and height of 8 cm is filling with water with the height of the water level is increasing at a rate of 0.1 cm/s. What is the rate the volume is increasing when the height of the water is level 2 cm.

C12 - 5.1 - Int Reimann's L/R/M RAM & Trap Hmk

Find the area under the graph $y = x^3$ from zero to two using four (n=4) rectangles. Using Riemann's LRAM, MRAM & RRAM, and Trapezoidal Rule .

C12 - 5.2 - Int Indefinite HW

C!

Integrate the following. (Find the Antiderivative) Don't forget to check by taking the derivative. And to add C!

$\int 5\, dx$

$\int 2x\, dx$

$\int x^2\, dx$

$\int \frac{x^2}{3}\, dx$

$\int 6x^2\, dx$

$\int (6x^2 + 2x)\, dx$

$\int \sqrt{x}\, dx$

$\int \frac{1}{x}\, dx$

$\int (x + 3)^2\, dx$

C12 - 5.3 - Int Area Definite HW

Find the area under the curve using Integration. Confirm the area by geometry.

$y = 2x$ $\quad 0 \leq x \leq 3$

$y = \sqrt{9 - x^2}$ $\quad$ Semicircle

Find the area under the curve using Integration.

$y = x^2$ $\quad 0 \leq x \leq 2$

$y = \sqrt{x}$ $\quad 0 \leq x \leq 9$

C12 - 5.3 - Int Area Between Hmk

Find the area between the curves using Integration.

$y = x \qquad y = \sqrt{x}$

$y = x^3 \qquad y = 4x$

$y = x^2 - 1 \qquad y = x + 1$

C12 - 5.4 - Int Volume HW

Find the Volume of revolution around the x-axis. Draw a graph.

$y = x^2$ $\quad\quad 0 \le x \le 2$

$y = \sqrt{x}$ $\quad\quad 0 \le x \le 4$

C12 - 5.4 - Int Volume of HW

Find the Volume of revolution around the x-axis between the two functions by Integration.

$y = x^2$ $\quad\quad$ $y = x$ $\quad\quad$ $0 \leq x \leq 1$