

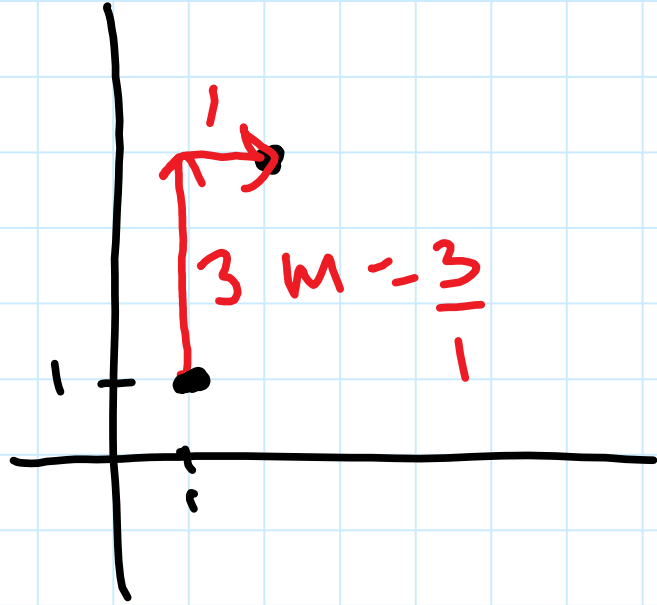
M10 - 6/7.0 - Q1ab Graphing Review

a) $(x_1, y_1) (x_2, y_2)$
 $(1, 1) (2, 4)$

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

$$m = \frac{(4) - (1)}{(2) - (1)}$$

$$m = \frac{3}{1}$$



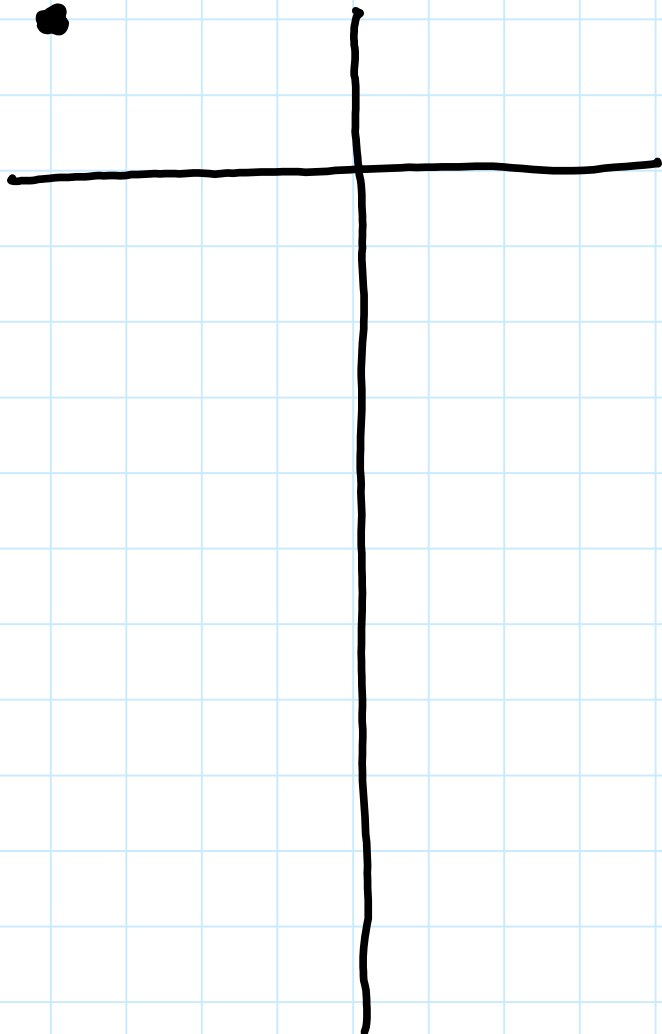
b) $(x_1, y_1) (x_2, y_2)$
 $(-4, 2) (2, -14)$

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

$$m = \frac{(-14) - (2)}{(2) - (-4)}$$

$$m = \frac{-16}{6}$$

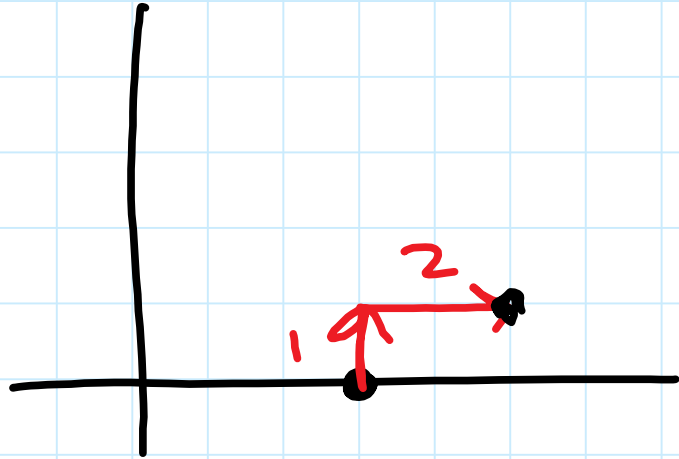
$$m = -\frac{8}{3}$$



1c) $(3,0)$ $(5,1)$

$$m = \frac{1-0}{5-3}$$

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



2a) $(x_1, y_1) (x_2, y_2) m=3$
 $(2, 4) (1, n) m=3$

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

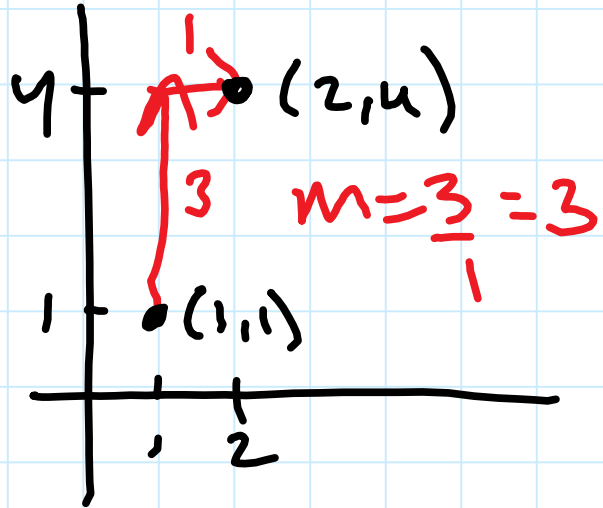
$$3 = \frac{n - 4}{1 - 2}$$

$$-1 \times 3 = n - 4 \quad | \quad \times -1$$

$$-3 = n - 4$$

$$+4 \quad +4$$

$$\boxed{n = 1} \quad \checkmark (1, 1)$$



$$2b) (n, 2) (2, 3) \quad m = 1$$

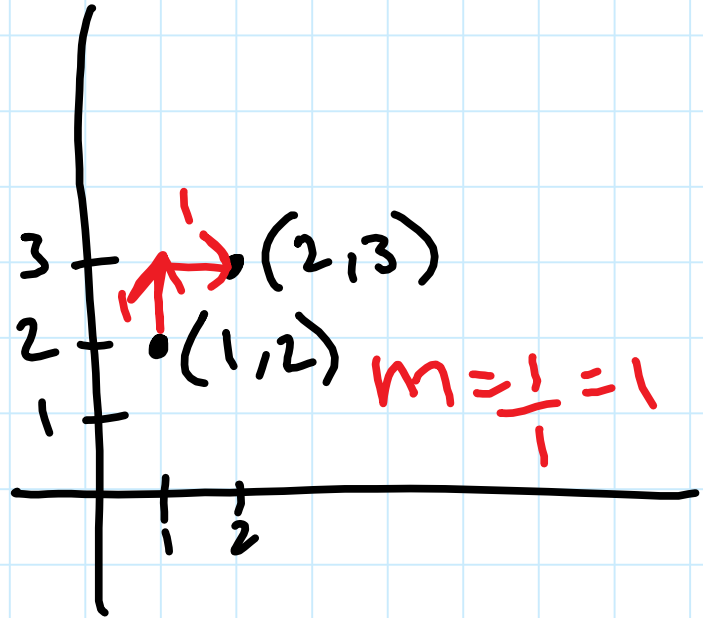
$$1 = \frac{3-2}{2-n}$$

~~$$(2-n) \times 1 = \frac{1}{2-n} \times (2-n)$$~~

$$\begin{array}{r} 2-n = 1 \\ -2 \quad -2 \end{array}$$

$$\begin{array}{r} -n = -1 \\ -1 \quad -1 \end{array}$$

$$n = 1 \quad \checkmark (1, 2)$$



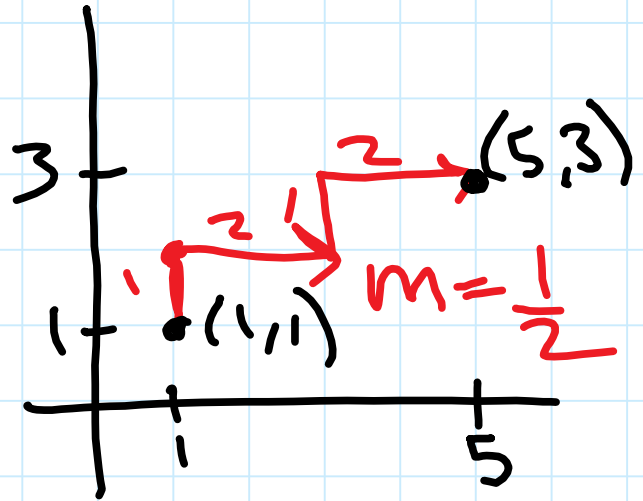
2c) $(1,1)$ $(5,n)$ $m = \frac{1}{2}$

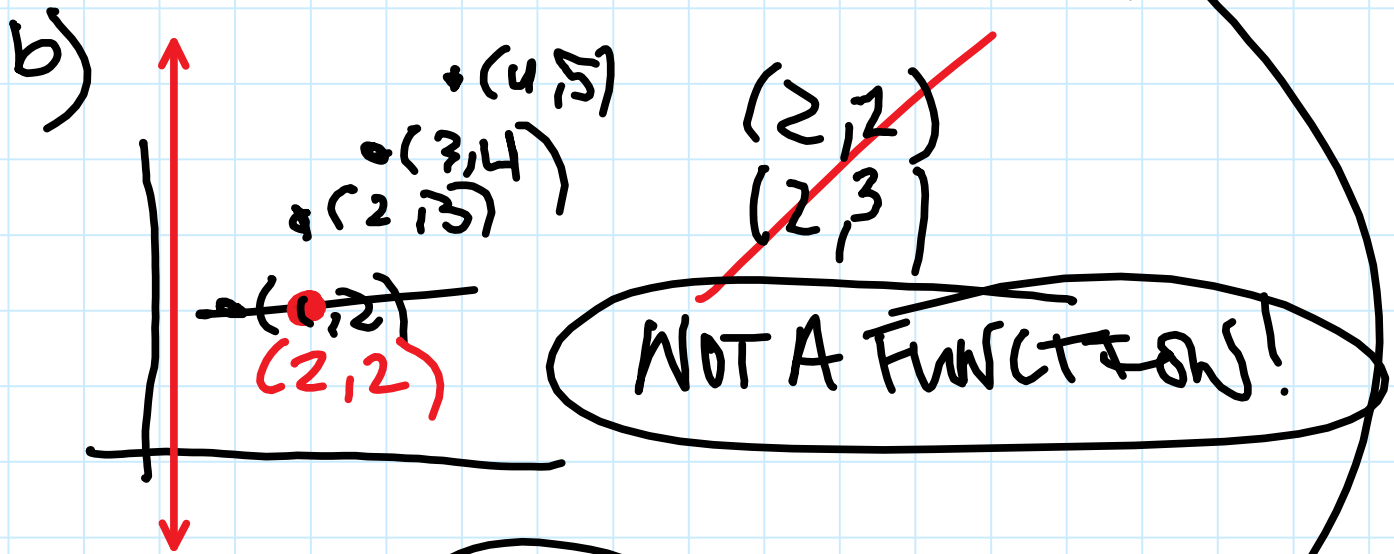
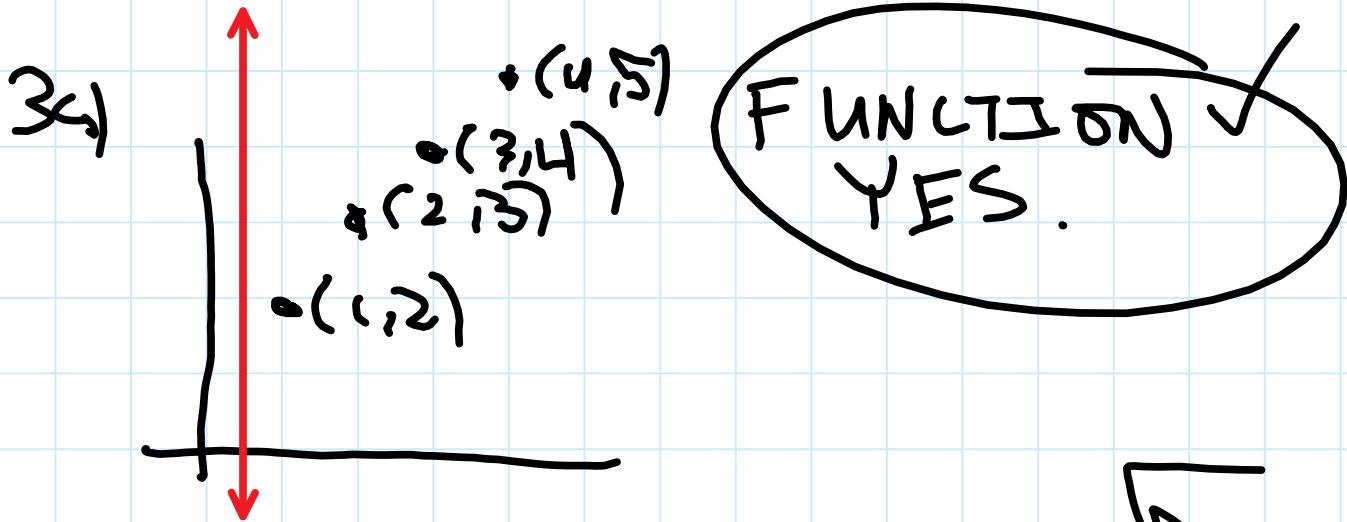
$$\frac{1}{2} = \frac{n-1}{5-1}$$

~~$\frac{4}{1} \times \frac{1}{2} = \frac{n-1}{4} \times 4$~~

$$2 = n - 1$$

+1 +1
 $n = 3$ ✓ $(5,3)$





c)

x	y
2	2
2	3
3	4
4	5

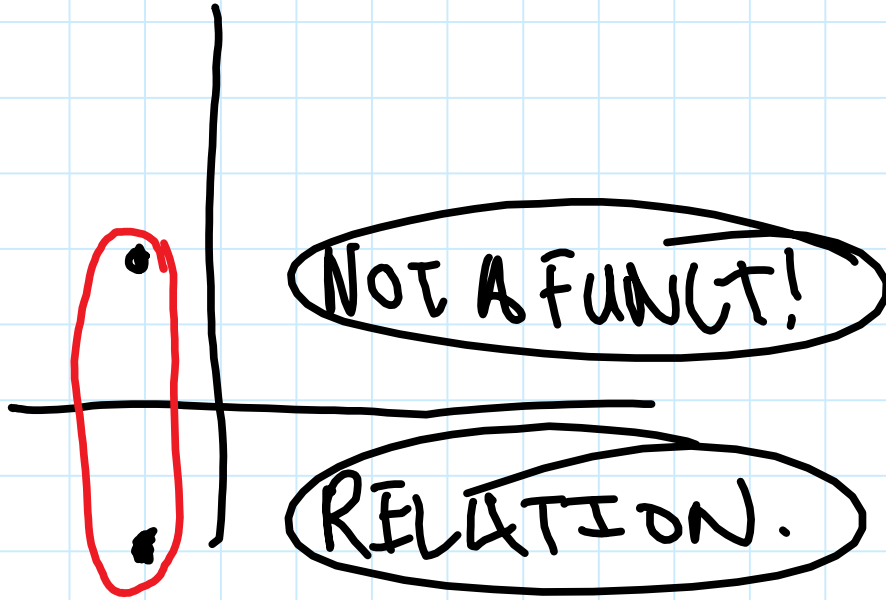
NOT A FUNCTION RELATION ✓

d)

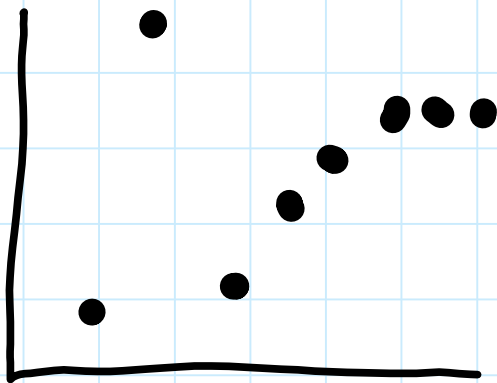
x	y
1	2
2	3
3	4
4	5

FUNCTION.

3e)



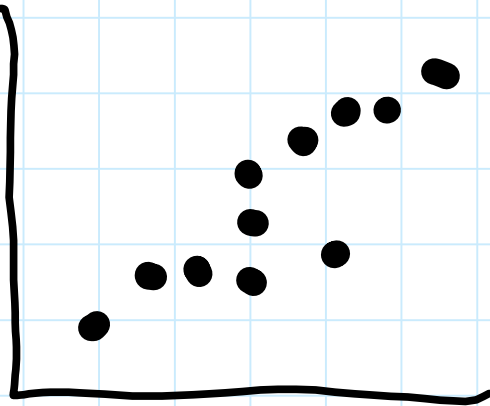
4a)



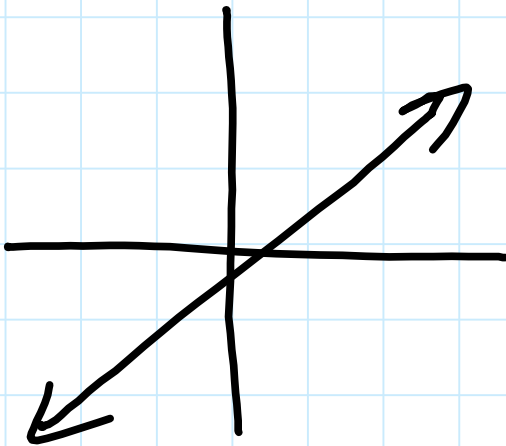
DISCRETE



4b)

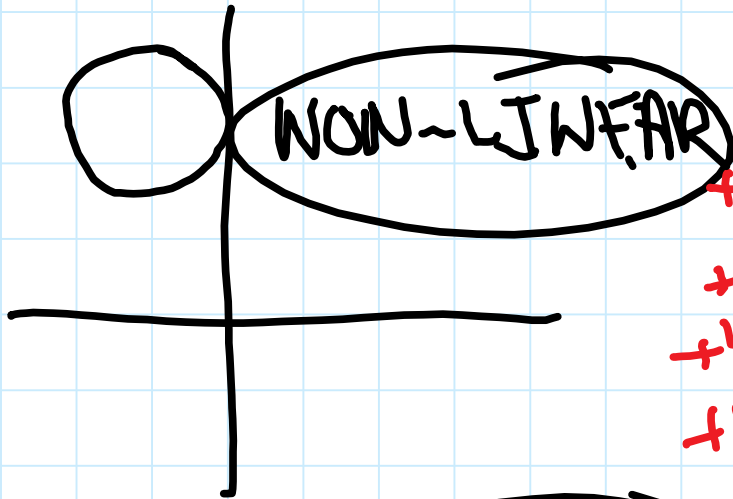


c)



CONTINUOUS.

5a)

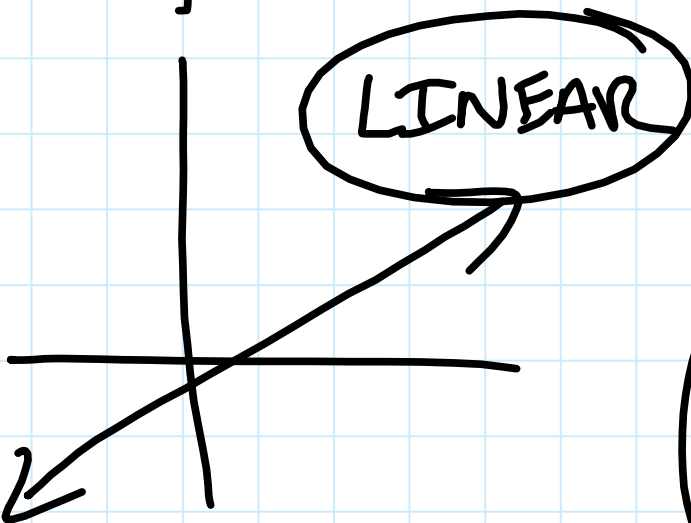


d)

x	y
-4	0
-2	3
0	6
4	12
8	18

Red arrows indicate the change in x and y between consecutive points: +2 for x and +3 for y between (-4,0) and (-2,3); +2 for x and +3 for y between (-2,3) and (0,6); +4 for x and +6 for y between (0,6) and (4,12); +4 for x and +6 for y between (4,12) and (8,18).

b)

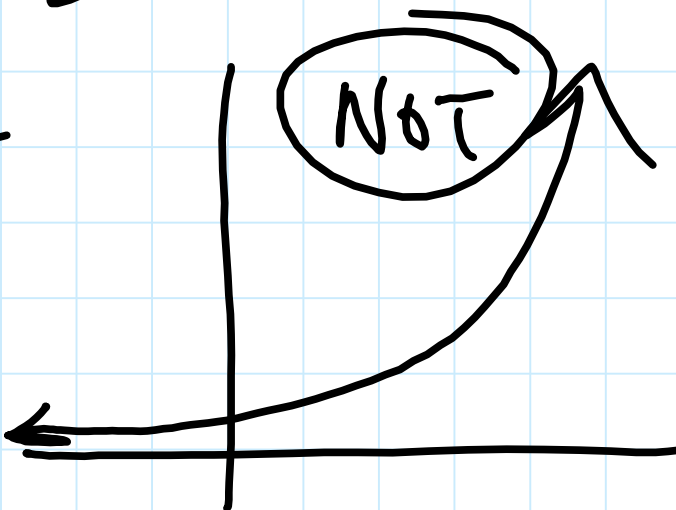


$$\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{3}{2} = \frac{3}{2}$$

$$m = \frac{6}{4} = \frac{3}{2}$$

c



LINEAR

6a)



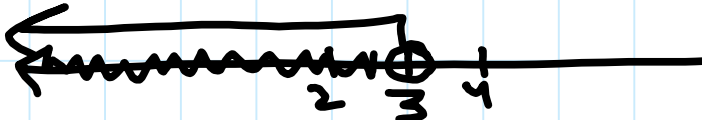
$\{x \mid x \geq 2, x \in \mathbb{R}\}$
 $[2, \infty)$ ✓

$x = 5$ $x \geq 2$
 $5 \geq 2$

KEY.

$(-\infty, \infty)$
$\bullet \bullet \geq \leq []$
$\infty < > ()$
$- - - - -$

b)



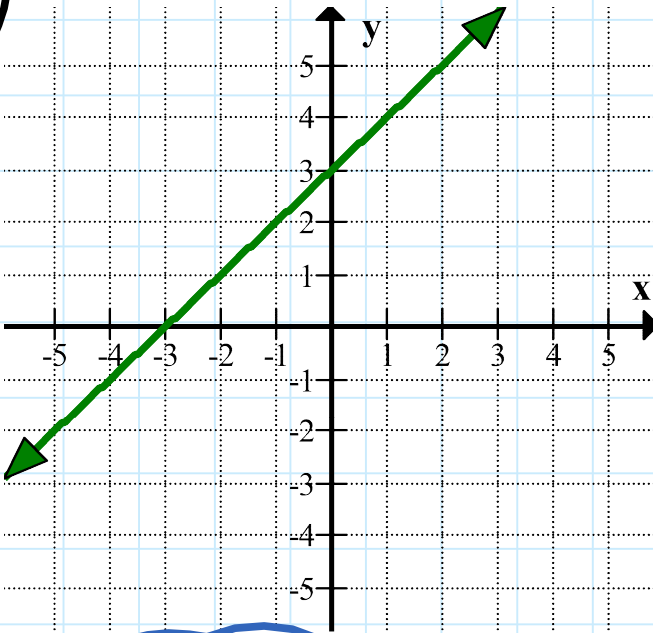
$\{x \mid x < 3, x \in \mathbb{R}\}$
 $(-\infty, 3)$

c)



$\{x \mid 2 \leq x < 3, x \in \mathbb{R}\}$
 $[2, 3)$

7a)



YES

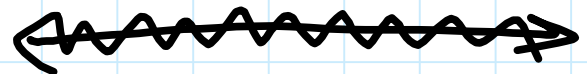
D: x CAN BE AN ELEMENT OF ALL REAL #S.



$$\{x | x \in \mathbb{R}\}$$

$$(-\infty, \infty)$$

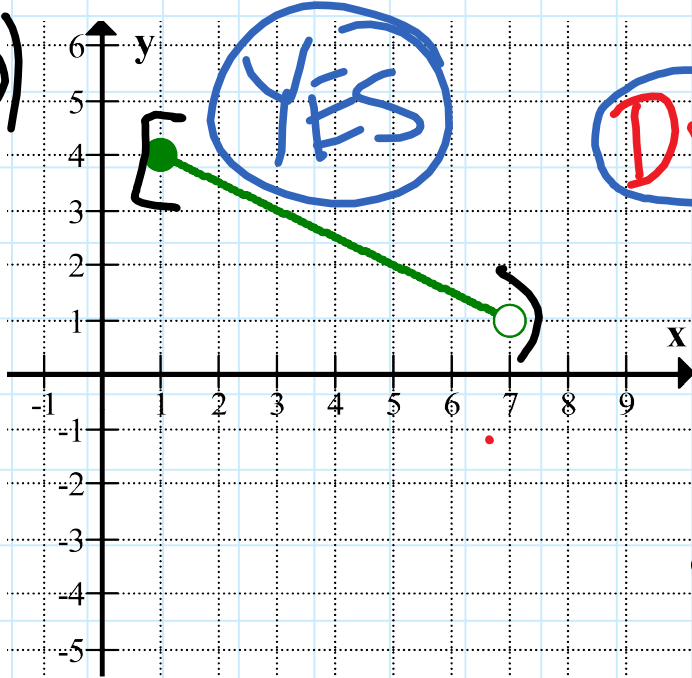
~~R~~ D: x CAN BE AN ELEMENT OF ALL REAL #S.



$$\{~~x~~ | ~~x~~ \in \mathbb{R}\}$$

$$(-\infty, \infty)$$

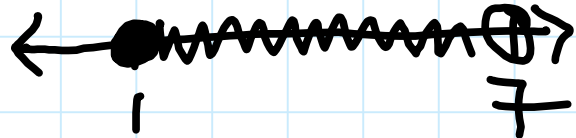
7b)



D: x CAN BE GREATER THAN ONE, AND LESS THAN SEVEN.

$$\{x \mid 1 < x < 7, x \in \mathbb{R}\}$$

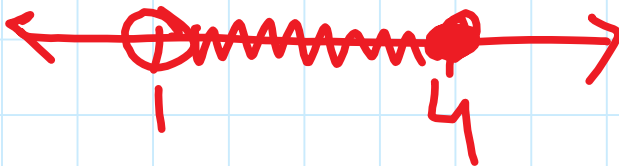
$$(1, 7)$$

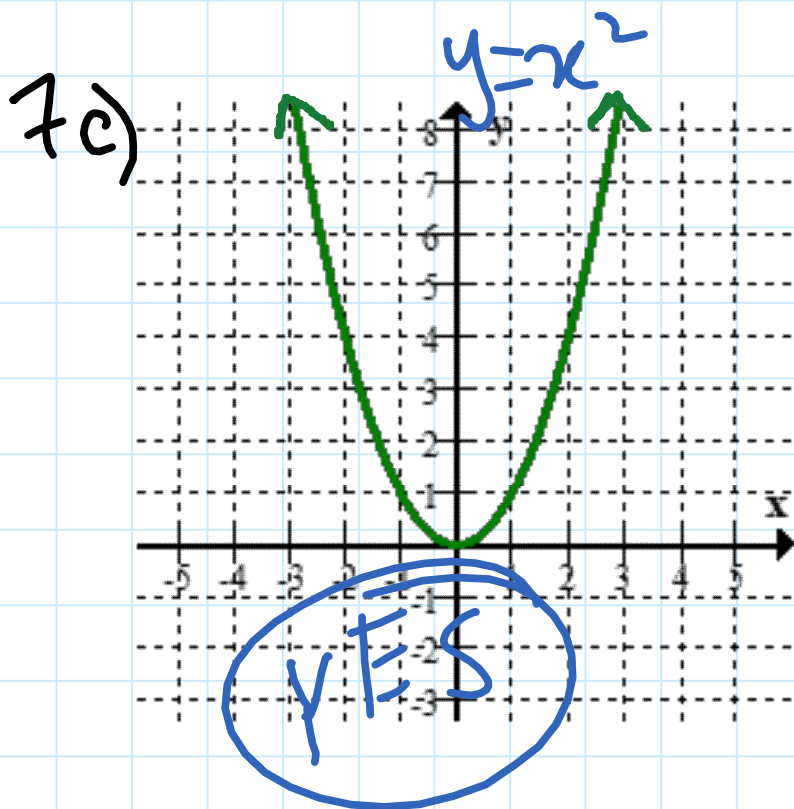


R: y CAN BE GREATER THAN 1, AND LESS THAN OR EQUAL TO FOUR.

$$\{y \mid 1 < y \leq 4, y \in \mathbb{R}\}$$

$$(1, 4]$$





D:

$$\{x | x \in \mathbb{R}\}$$

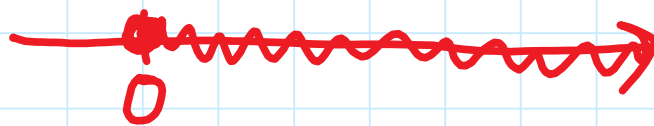
$$(-\infty, \infty)$$



R:

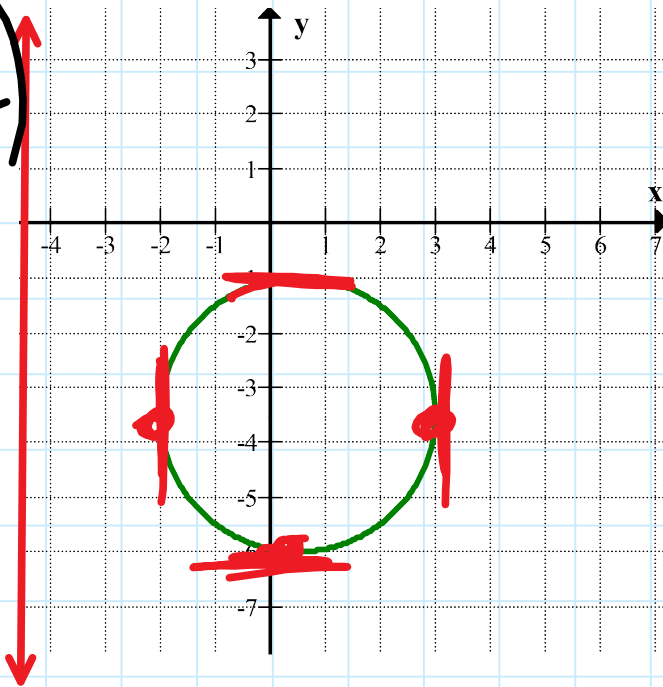
$$\{y | y \geq 0, y \in \mathbb{R}\}$$

$$[0, \infty)$$



R

7d)

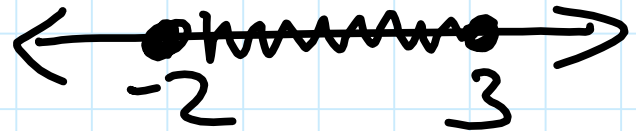


NOT

D:

$$\{x \mid -2 \leq x \leq 3; x \in \mathbb{R}\}$$

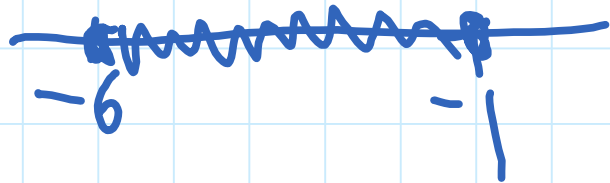
$$[-2, 3]$$



R:

$$\{y \mid -6 \leq y \leq -1\}$$

$$[-6, -1]$$



b) a)

$y = mx + b \leftarrow y\text{-INT}$
 \uparrow
 SLOPE

$m = 4, (0, -1)$

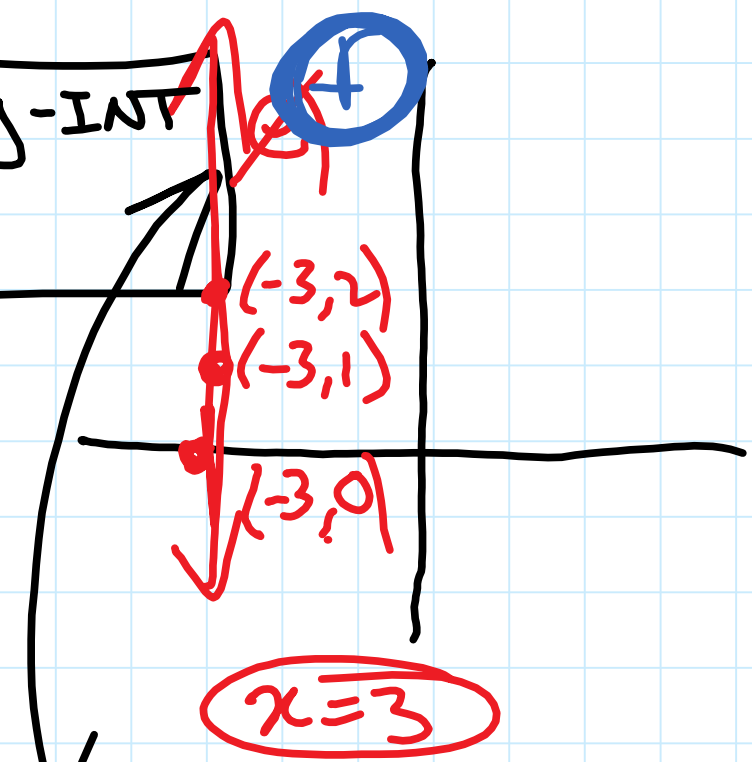
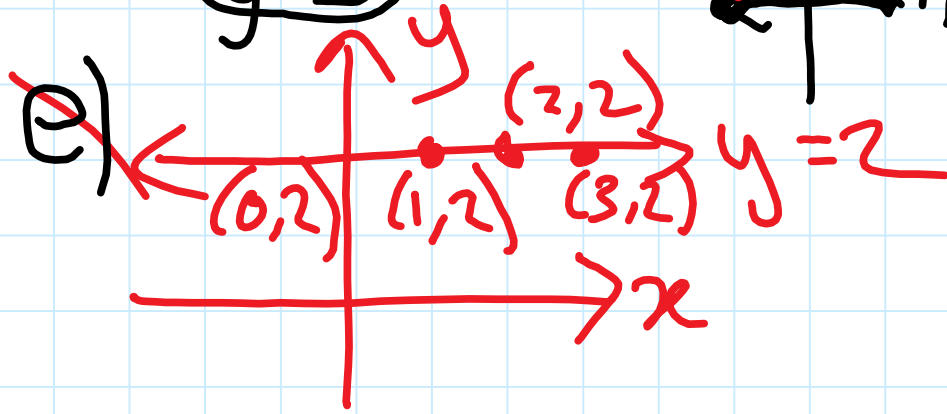
$y = 4x - 1$

b) $m = \frac{3}{2}, (0, 2)$

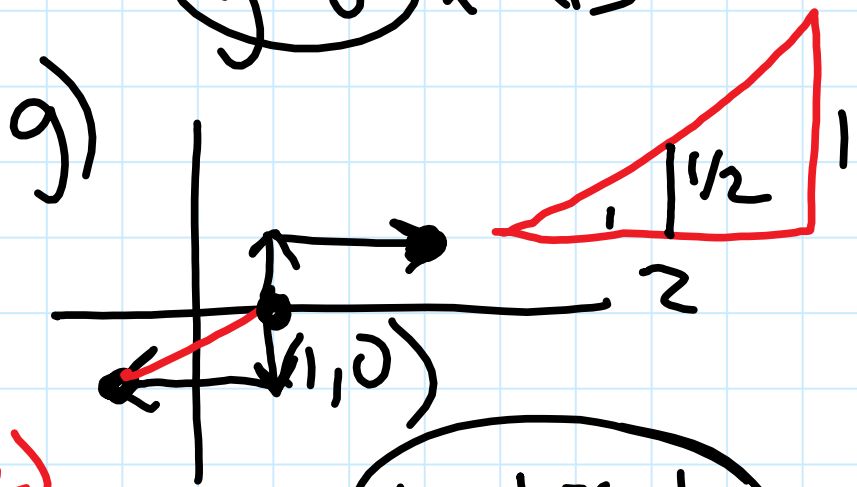
$y = \frac{3}{2}x + 2$

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

d) $y = 0x + 2$
 $y = 2$



e) $\text{SLOPE} = 0, y\text{-INT} = 0$
 $y = 0$ x-axis $(0, 0)$



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

9a) $y = -3x - 4$

$m = -3$
 $y_{int} = (0, -4)$

b) $y = \frac{3}{2}x - 2$

$m = \frac{3}{2}$
 $y_{int} = (0, -2)$

c) $y = 0.02x + 0$

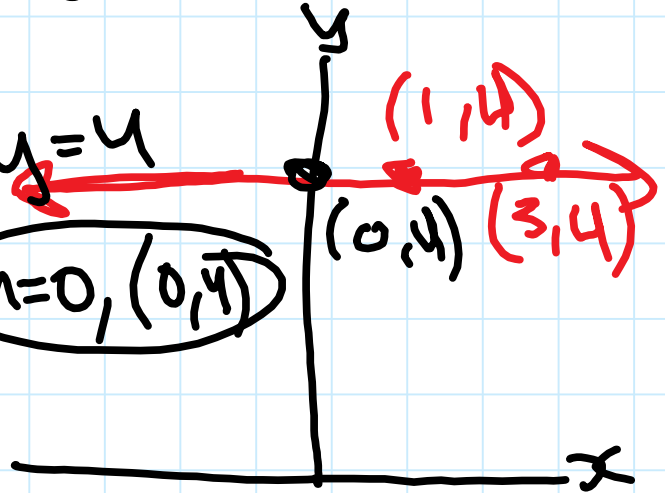
$m = 0.02$
 $y_{int} = (0, 0)$

d) $y = x + 0$

$m = 1, (0, 0)$

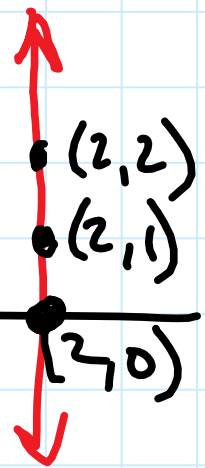
e) $y = 4$

$m = 0, (0, 4)$



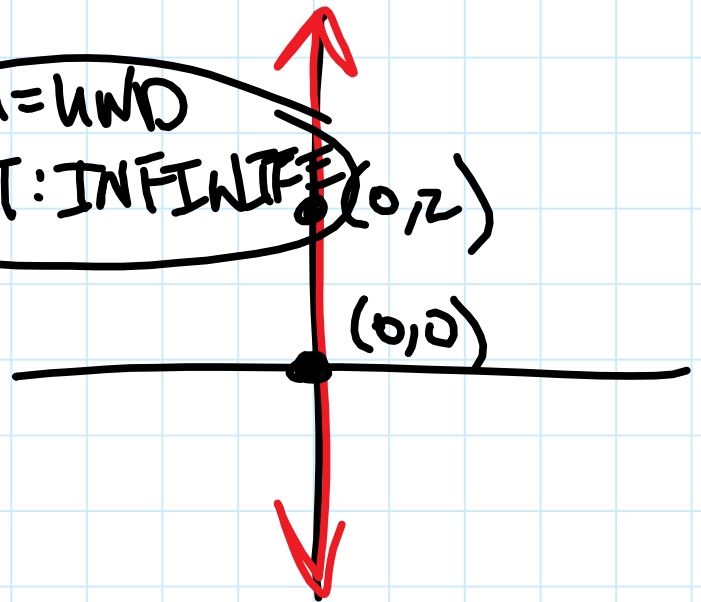
f) $x = 2$

$m = \text{UND}$
 $y_{int} = \text{NONE}$



g) $x = 0$

$m = \text{UND}$
 $y_{int} = \text{INFINITE}$



10a) $(2, -3) \quad m=4$

$$y - y_1 = m(x - x_1)$$

$$y - (-3) = 4(x - 2)$$

$$y + 3 = 4(x - 2)$$

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

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

c) $y - (-3) = 0(x - 0)$

$$y + 3 = 0$$

d) $x = 0$

e) $2x + 3y = 6$

$$-2x \quad -2x$$

$$\frac{3y}{3} = \frac{-2x + 6}{3}$$

$$y = \frac{-2}{3}x + 2$$

$$m = -\frac{2}{3} \quad (0, 2)$$

$$y - 2 = -\frac{2}{3}(x - 0)$$

$$y - 2 = -\frac{2}{3}x$$

$$1) a) \boxed{y - y_1 = m(x - x_1)}$$

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

$$\boxed{m = \frac{1}{3} (2, -3)}$$

$$b) y - 4 = -1(x + 2)$$

$$\boxed{m = -1 (-2, 4)}$$

$$c) y + 2 = 1(x)$$

$$\boxed{m = 1 (0, -2)}$$

$$d) y = 1(x)$$

$$\boxed{m = 1 (0, 0)}$$

$$e) y + 1 = 0(x + 0)$$

$$\boxed{m = 0 (0, -1)}$$

$$f) x = 0$$

$$0 = 1(x)$$

$$\boxed{m = \text{UNDEF} (0, 0)}$$

12) $(-2, -2)$ $(4, 1)$

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

$$m = \frac{1 - (-2)}{4 - (-2)}$$

$$m = \frac{1 + 2}{4 + 2}$$

$$m = \frac{3}{6}$$

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

$$y = mx + b$$

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

$$1 = \frac{1}{2} \cdot 4 + b$$

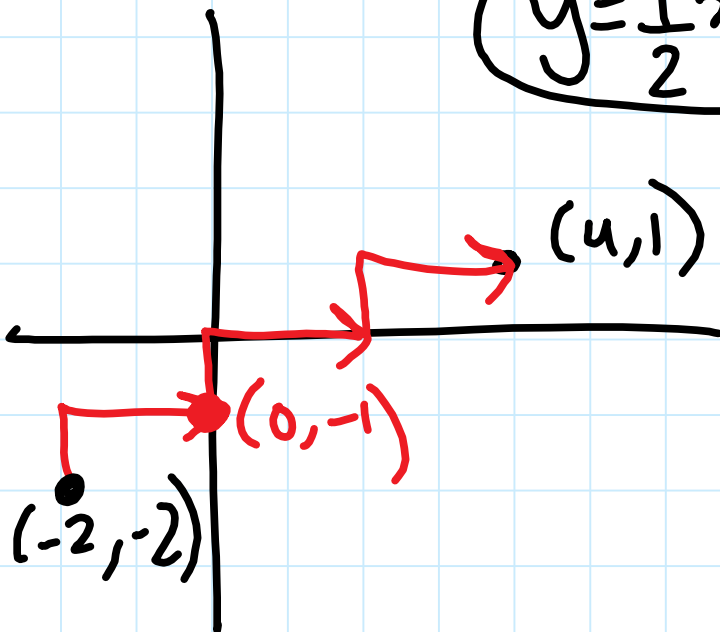
$$1 = \frac{4}{2} + b$$

$$1 = 2 + b$$

$$-2 = b$$

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

x, y
 $(4, 1)$



13) $y = mx + b$

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

$y = x - 5$

b) $y + 4 = \frac{2}{3}(x + 3)$

$y + 4 = \frac{2}{3}x + 2$

$y = \frac{2}{3}x - 2$

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

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

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

d) $x + y + 4 = 0$

$ax + by + c = 0$

$y = -x - 4$

e) $2x + \frac{1}{2}y - 4 = 0$

$-2x + 4 = -2x + 4$

$\frac{1}{2}y = -2x + 4$ $\times 2$

$y = -4x + 8$

f) $\frac{1}{2}x - \frac{2}{3}y + 1 = 0$ $\times 6$

$3x - 4y + 6 = 0$

$-3x - 6 = -3x - 6$

$-\frac{4}{4}y = \frac{-3x - 6}{-4}$

$y = \frac{3}{4}x + \frac{3}{2}$

$$14a) \boxed{ax+by=c} \rightarrow \boxed{ax+by+c=0}$$

$$y = 1x - 8$$

$$\begin{array}{r} -y \quad -y \\ \hline 0 = x - y - 8 \\ +8 \quad \quad +8 \end{array}$$

$$\boxed{x - y = 8}$$

NO FRACTIONS
+x, 1ST.

$$d) \left(\frac{y}{2} = -\frac{2x-2}{3} \right) \times 6$$

$$3y = -4x - 12$$

$$+4x \quad +4x$$

$$\boxed{4x + 3y = -12}$$

$$b) \left(y = \frac{1}{2}x - 5 \right) \times 2$$

$$2y = x - 10$$

$$\begin{array}{r} -2y \quad -2y \\ \hline 0 = x - 2y - 10 \\ +10 \quad \quad +10 \end{array}$$

$$\boxed{x - 2y = 10}$$

$$c) y = 8x$$

$$\begin{array}{r} -y \quad -y \\ \hline 0 = 8x - y \end{array}$$

$$14) \boxed{ax+by=c} \rightarrow \boxed{ax+by+c=0}$$

$$e) \begin{aligned} y-4 &= 2(x-5) \\ y-4 &= 2x-10 \\ &+4 \qquad +4 \end{aligned}$$

$$y = 2x - 6$$

$$0 = 2x - y - 6$$

$$2x - y = 6$$

$$g) \left(y + \frac{2}{3} = -\frac{1}{2}(x-3) \right) \times 6$$

$$\begin{aligned} 6y + 4 &= -3(x-3) \\ 6y + 4 &= -3x + 9 \\ &-4 \qquad -4 \end{aligned}$$

$$6y = -3x + 5$$

$$3x + 6y = 5$$

$$f) \left(y + 4 = 2(x+6) \right) \times 3$$

$$\begin{aligned} 3y + 12 &= 2(x+6) \\ 3y + 12 &= 2x + 12 \\ &-12 \qquad -12 \end{aligned}$$

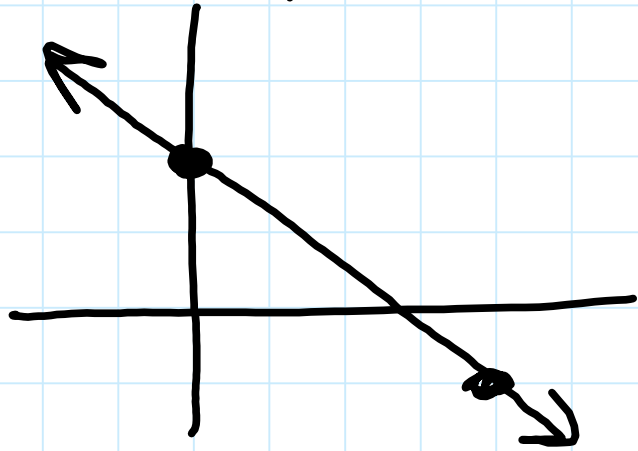
$$3y = 2x$$

$$0 = 2x - 3y$$

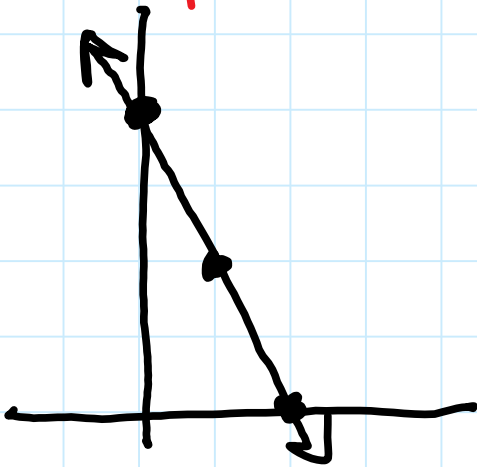
15a) $y = mx + b$ ← Y-INT
↑
SLOPE



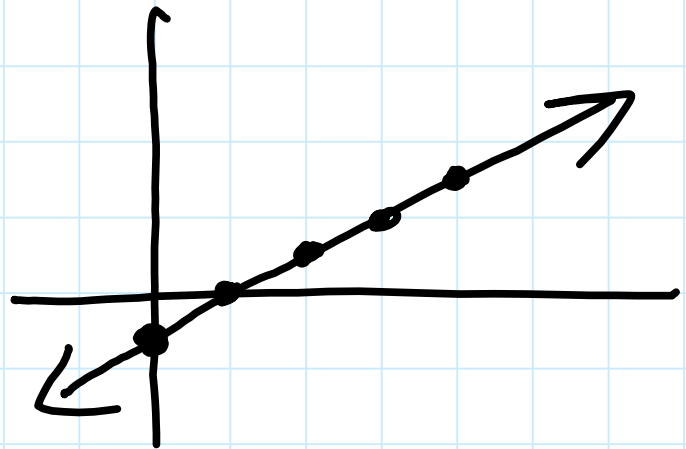
c) $y = -\frac{3}{4}x + 2$

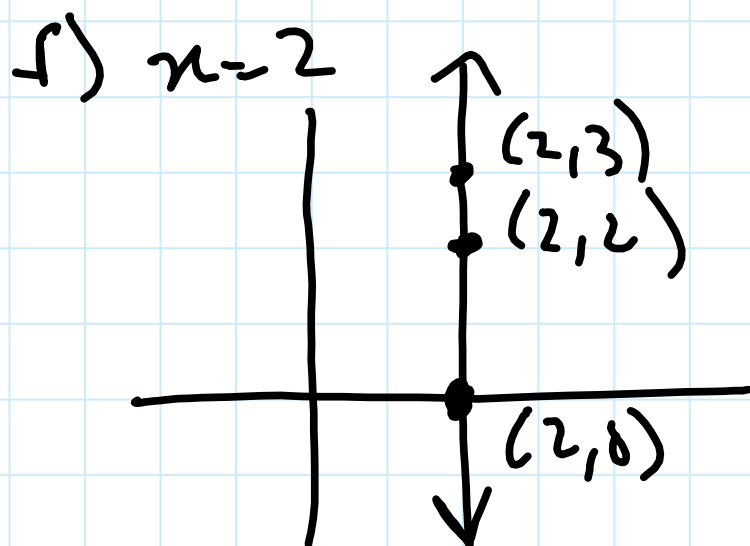
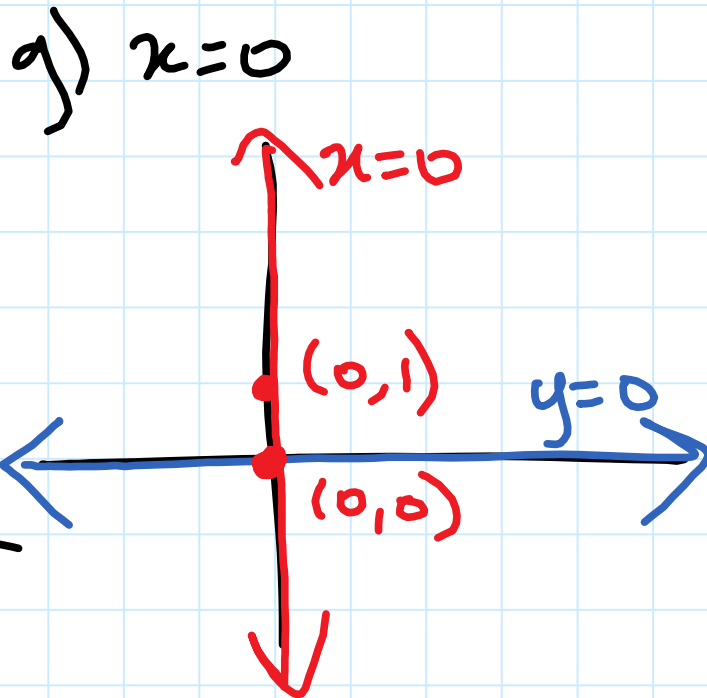
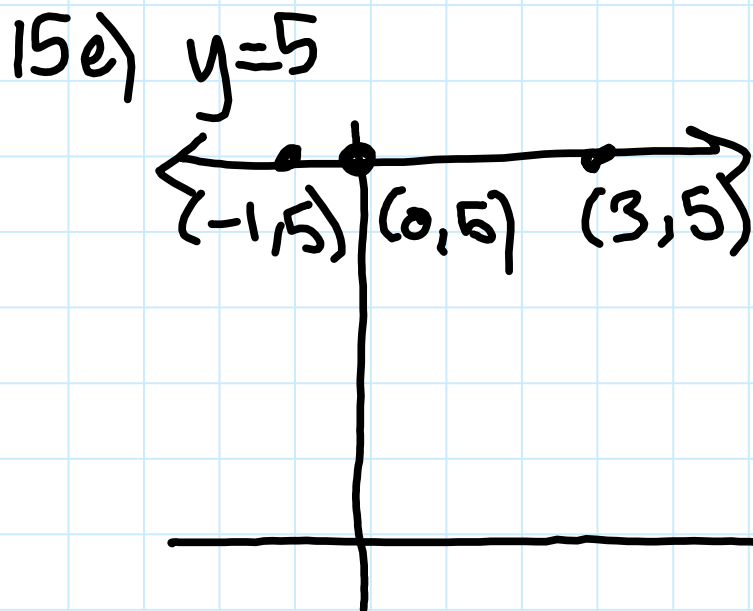


b) $y = -2x + 4$



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





16a) $\boxed{ax+by=c}$

$$3x+2y=6$$

$$3(\cancel{0})+2y=6$$

$$\frac{2y}{2} = \frac{6}{2}$$

$$y=3$$

x	y
0	3
2	0

$$3x+2y=6$$

$$-3x$$

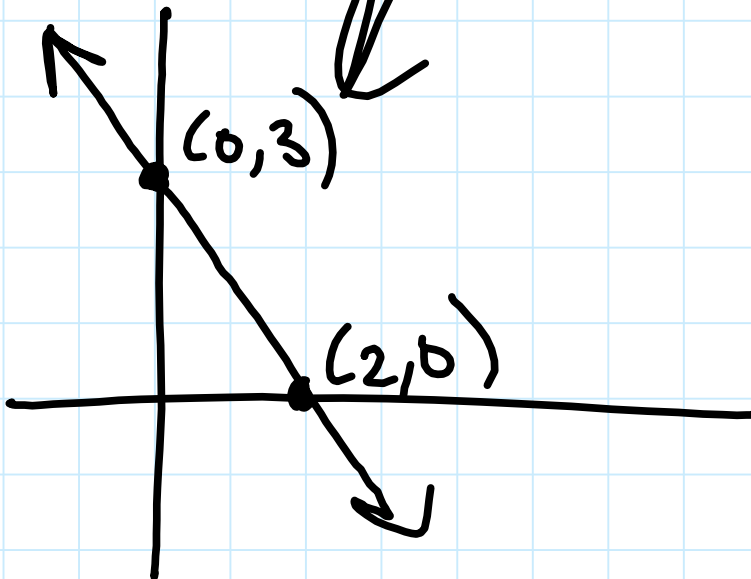
$$\frac{2y}{2} = \frac{-3x+6}{2}$$

$$y = -\frac{3}{2}x + 3$$

$$3x+2(\cancel{0})=6$$

$$\frac{3x}{3} = \frac{6}{3}$$

$$x=2$$



$$16b) \quad 2y + 3x + 6 = 0$$

$$2y + 3x = -6$$

$$2y + 3(\cancel{0}) = -6$$

$$\frac{2y}{2} = \frac{-6}{2}$$

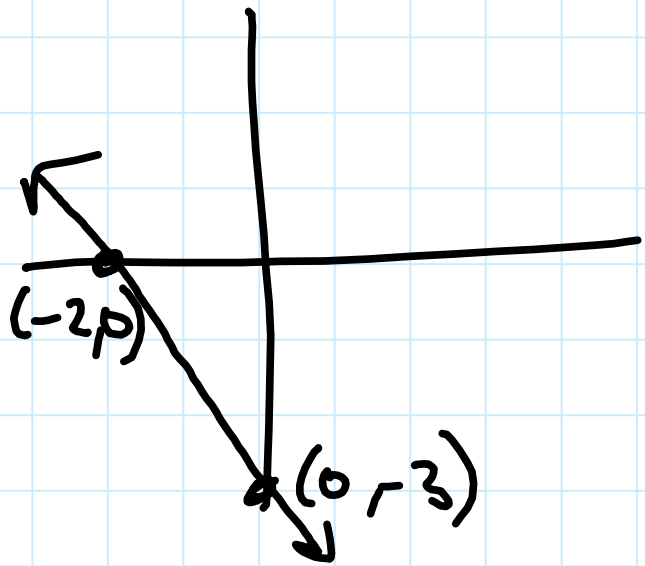
$$y = -3$$

$$\cancel{2(0)} + 3x = -6$$

$$\frac{3x}{3} = \frac{-6}{3}$$

$$x = -2$$

x	y
0	-3
-2	0

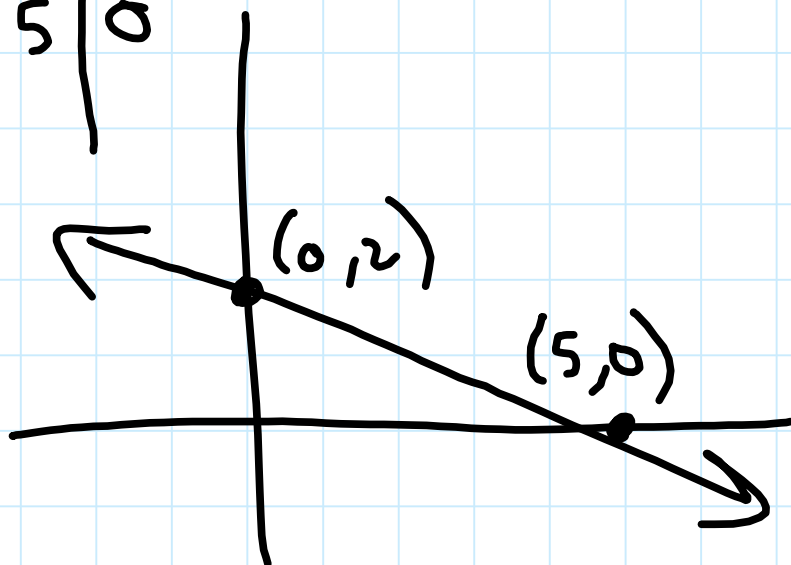


$$16)c) \quad 2x + 5y = 10$$

$$\begin{array}{r} 5y = 10 \\ \hline 5 \quad 5 \\ \hline y = 2 \end{array}$$

$$\begin{array}{r} 2x = 10 \\ \hline 2 \quad 2 \\ \hline x = 5 \end{array}$$

$$\begin{array}{r|l} x & y \\ \hline 0 & 2 \\ 5 & 0 \end{array}$$



16d) $3x + 4y = 6$

$$\frac{4y}{4} = \frac{6}{4}$$

$$y = \frac{3}{2}$$

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

$$\frac{3x}{3} = \frac{6}{3}$$

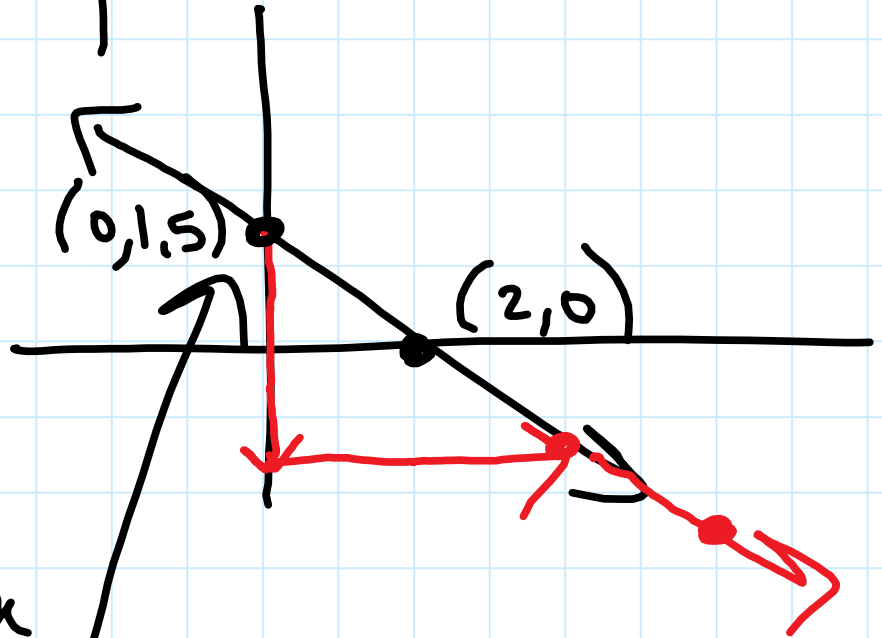
$$x = 2$$

$$3x + 4y = 6$$

$$-3x \quad -3x$$

$$\frac{4y}{4} = \frac{-3x + 6}{4}$$

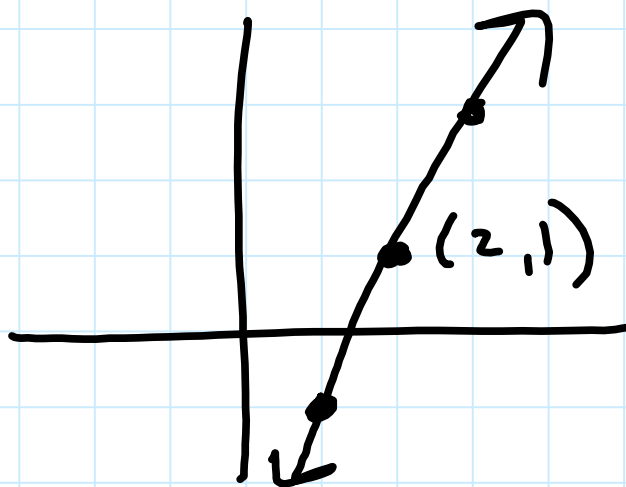
$$y = -\frac{3}{4}x + \frac{3}{2}$$



$$17a) \boxed{y - y_1 = m(x - x_1)}$$

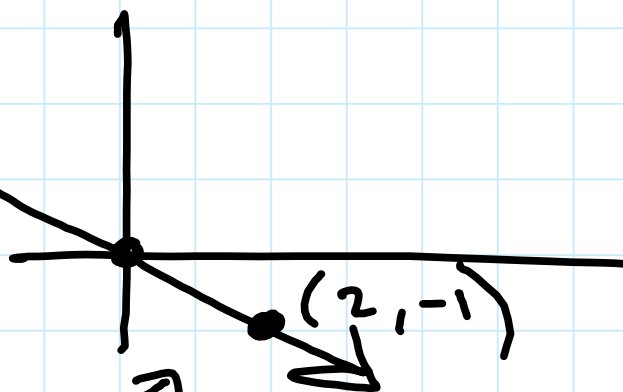
$$y - 1 = 2(x - 2)$$

$$m = 2 \quad (2, 1)$$



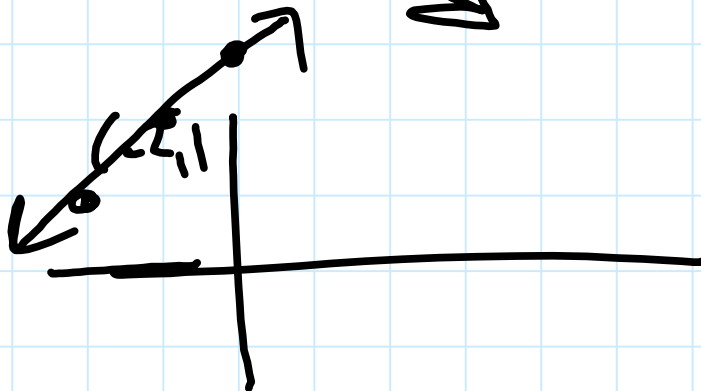
$$b) y + 1 = -\frac{1}{2}(x - 2)$$

$$m = -\frac{1}{2} \quad (2, -1)$$

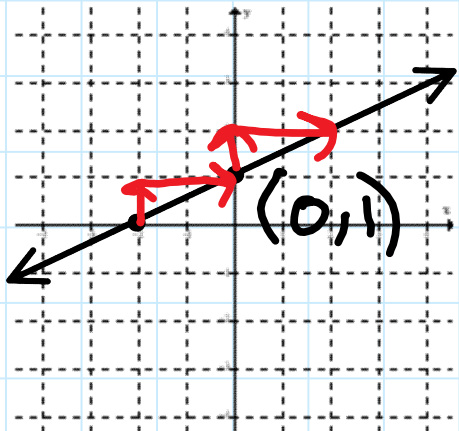


$$c) y - 1 = 1(x + 2)$$

$$m = 1 \quad (-2, +1)$$



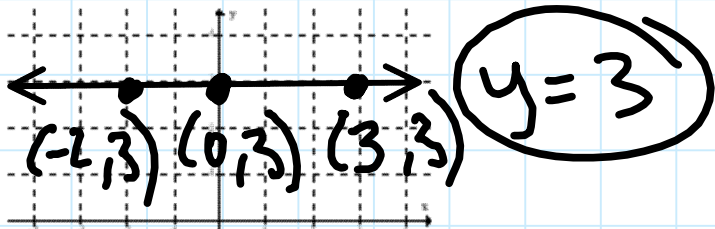
18a)



$$y = mx + b$$

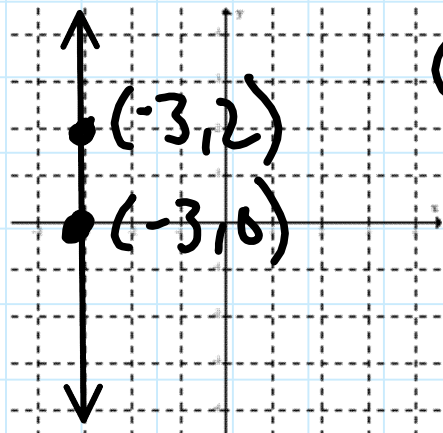
$$y = \frac{1}{2}x + 1$$

b)



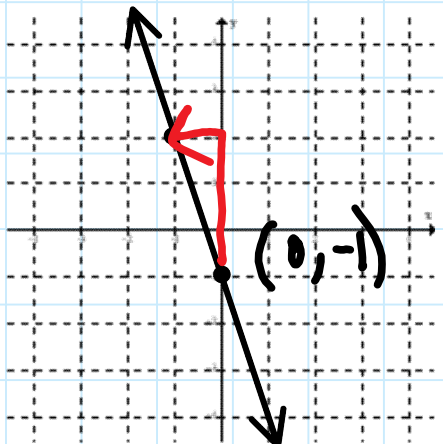
$$y = 3$$

c)



$$x = -3$$

d)



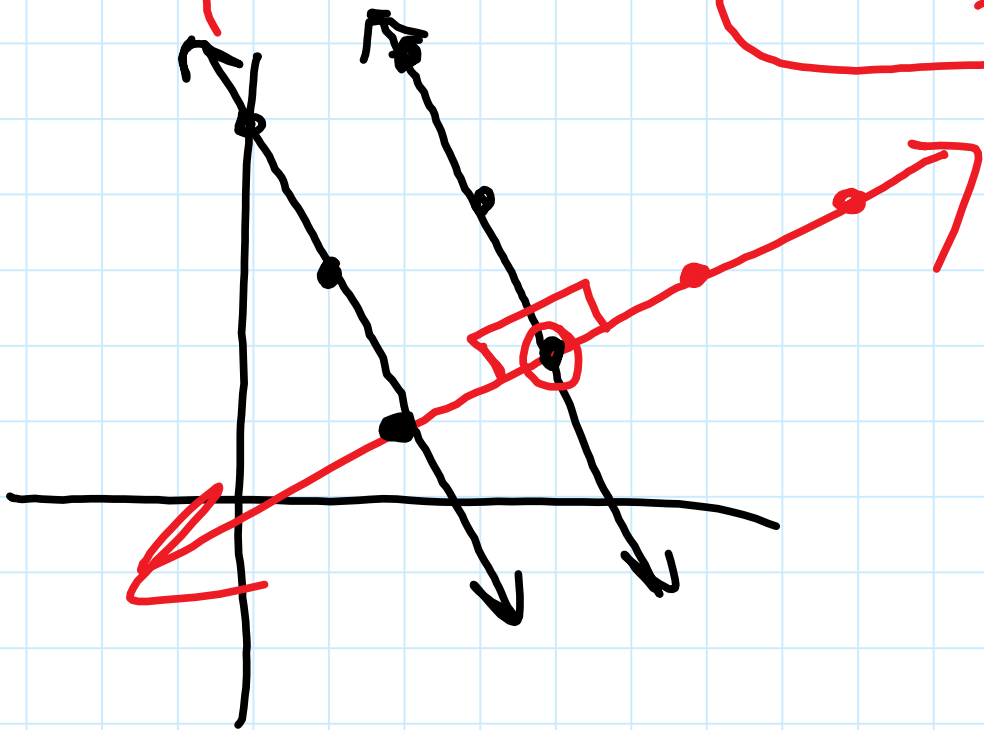
$$y = -\frac{1}{3}x - 1$$

19)a)

$m = -2$

$m_{||} = -2$

$m_{\perp} = +\frac{1}{2}$

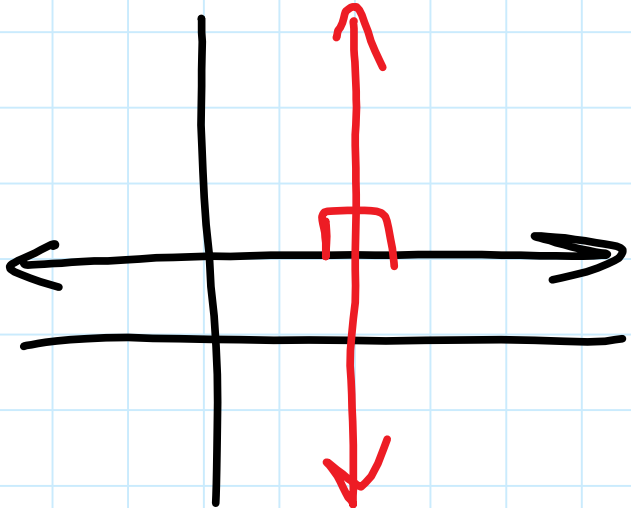


b) $m = \frac{3}{2}$

$m_{||} = \frac{3}{2}$ $m_{\perp} = -\frac{2}{3}$

c) $m = 0$

$m = 0$ $m_{\perp} = \text{undefined}$



20) a)

$m = \frac{p}{5}$ $m = \frac{2}{1}$ $5 \times \frac{p}{5} = 2 \times 5$
 $m = \frac{10}{5} = 2$ $p = 10$ ✓
 $m = \frac{-5}{2}$ $10 \times \left(\frac{5p}{2} = \frac{-1}{2} \right) \times 10$
 $\frac{-5}{2} \div \frac{-5}{1} = \frac{-5}{2} \times \frac{1}{-5} = \frac{1}{2}$
 $\frac{-5}{2} \times \frac{1}{-5} = \frac{1}{2}$

$\frac{5p}{2} = \frac{-1}{2}$
 $p = \frac{-1}{2} \times 2 = -1$ ✓

2a)b) $m = \frac{8}{p}$ $m = -\frac{1}{2}$

~~$\frac{8}{p} = \frac{+2}{\cancel{p}}$~~

$\frac{8}{2} = \frac{2}{\cancel{2}p}$
 $p = 4$

$2p \left(\frac{8}{p} = -\frac{1}{2} \right) 2p$
 $16 = -1p$
 $p = -16$

21a) $y = -2x + 1$ $y = 2x + 4$
 $m = -2$ $m = 2$ **NEITHER**

b) $0 = 3x + 5 - y$ $3y = -1x - 6$
 $+y$ $+y$
 $y = 3x + 5$ $y = -\frac{1}{3}x - 2$
 $m = \frac{3}{1}$ $m = -\frac{1}{3}$ **PERPENDICULAR.**

c) $y - x - 9 = 0$ $y = x + 2$
 $+x + 9$ $+x + 9$
 $y = x + 9$ $m = 1$ **PARALLEL**
 $m = 1$

$$22) \quad \overset{2,4}{(6,0)} \quad (-4,9) \quad (-7,10)$$

$$m = \frac{10 - 9}{-7 - (-4)}$$

$$m = \frac{1}{-3}$$

$$m_{\perp} = -\frac{1}{3} \quad m_{\perp} = 3$$

$$y = mx + b$$

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

$$0 = -\frac{1}{3}(6) + b$$

$$0 = -2 + b$$

$$+2 \quad +2$$

$$b = 2$$

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

$$y = 3x + b$$

$$0 = 3(6) + b$$

~~$$b = 18$$~~

$$0 = 18 + b$$

$$-18 \quad -18$$

$$b = -18$$

$$y = 3x - 18$$

$$23) (1, 7) (-3, -1)$$

$$m = \frac{-1 - 7}{-3 - 1}$$

$$m = \frac{-8}{-4}$$

$$m = 2$$

$$m_{\parallel} = 2 \quad m_{\perp} = \frac{1}{2}$$

$$24) \quad y = 2x + 1 \quad \overset{2,4}{(3,5)}$$

$$m = 2$$

$$y = mx + b$$

$$y = 2x + b$$

$$5 = 2(3) + b$$

$$5 = 6 + b$$

$$-6 \quad -6$$

$$b = -1$$

$$y = 2x - 1$$

$$m_{\perp} = -\frac{1}{2}$$

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

$$5 = -\frac{1}{2}(3) + b$$

$$\left(5 = -\frac{3}{2} + b\right) \times 2$$

$$10 = -3 + 2b$$

$$+3 \quad +3$$

$$\frac{13}{2} = \frac{2b}{2}$$

$$b = \frac{13}{2}$$

$$y = -\frac{1}{2}x + \frac{13}{2}$$

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

x	y
3	5
4	6

$$y = f(x)$$

a) $f(3) = 3 + 2$
 $f(3) = 5$

b) $f(x) = 6$
 $6 = x + 2$
 $-2 \quad -2$
 $x = 4$

c) $f(x+5) = (x+5) + 2$
 $f(x+5) = x + 7$

d) $f(3x) = 3x + 2$

$$\begin{aligned} f(x) &= x + 2 \\ y &= x + 2 \end{aligned}$$

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

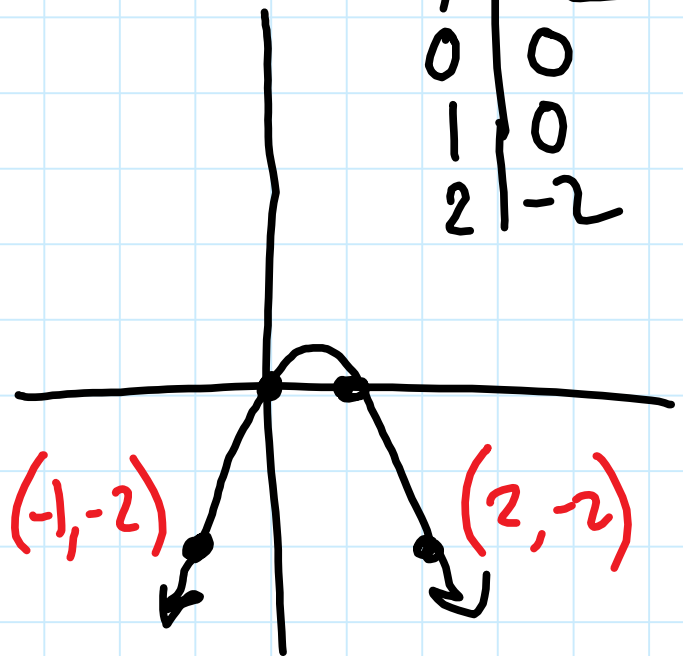
x	y
-1	-2

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

b) $f(x) = -2$
 $-2 = -x^2 + x$
 $+2 \quad +2$
 $0 = -x^2 + x + 2$
 $\frac{0}{-1} = \frac{-x^2}{-1} + \frac{x}{-1} + \frac{2}{-1}$
 $0 = x^2 - x - 2$
 $0 = (x-2)(x+1)$

$x-2=0$ $x+1=0$
 $+2+2$ $-1-1$
 $x=2$ ~~$x=1$~~
 $x=-1$

x	y
-1	-2
0	0
1	0
2	-2



$$27) a) A = \pi r^2$$

$$A(r) = \pi r^2$$

$$y = mx + b$$

$$f(x) = mx + b$$

$$A(5) = \pi 5^2$$

$$= 25\pi$$

$$A(5) = 78.5 \text{ cm}^2$$

THE AREA WHEN $r=5$ IS 78.5 cm^2

$$b) C(x) = 100x - 500 \quad c(x) = 500$$

$$500 = 100x - 500$$

$$+500 \quad +500$$

$$\underline{1000} = \underline{100x}$$

$$\frac{1000}{100} = \frac{100x}{100}$$

$$x = 10$$

x is 10, WHEN $c(x) = 500$.

28) a) (1,3) (5,6)

$$\sqrt{a^2 + b^2} = c$$

$$c = \sqrt{a^2 + b^2}$$

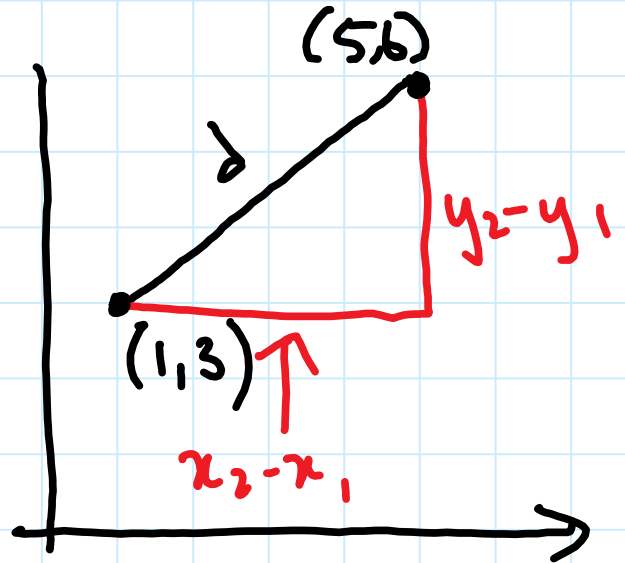
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(5-1)^2 + (6-3)^2}$$

$$d = \sqrt{16+9}$$

$$d = \sqrt{25}$$

$$d = 5$$

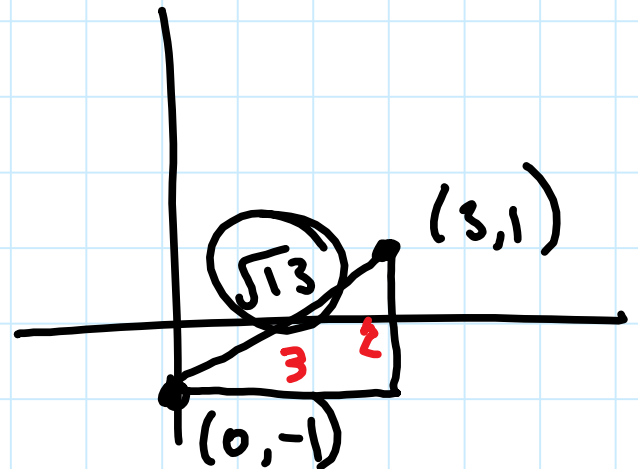


b) (0,-1) (3,1)

$$d = \sqrt{(3-0)^2 + (1-(-1))^2}$$

$$d = \sqrt{9+4}$$

$$d = \sqrt{13}$$

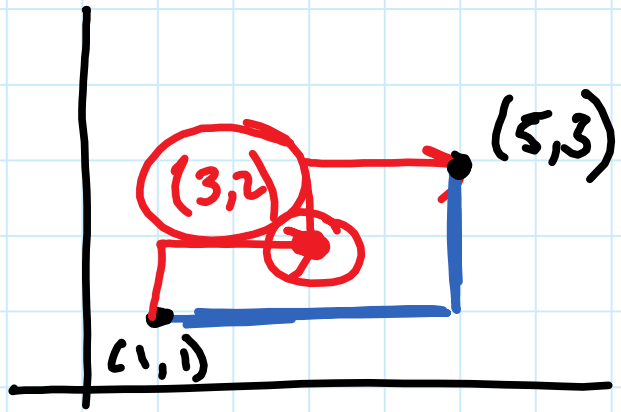


2a) (1,1) (5,3)

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$M = \left(\frac{1+5}{2}, \frac{1+3}{2} \right)$$

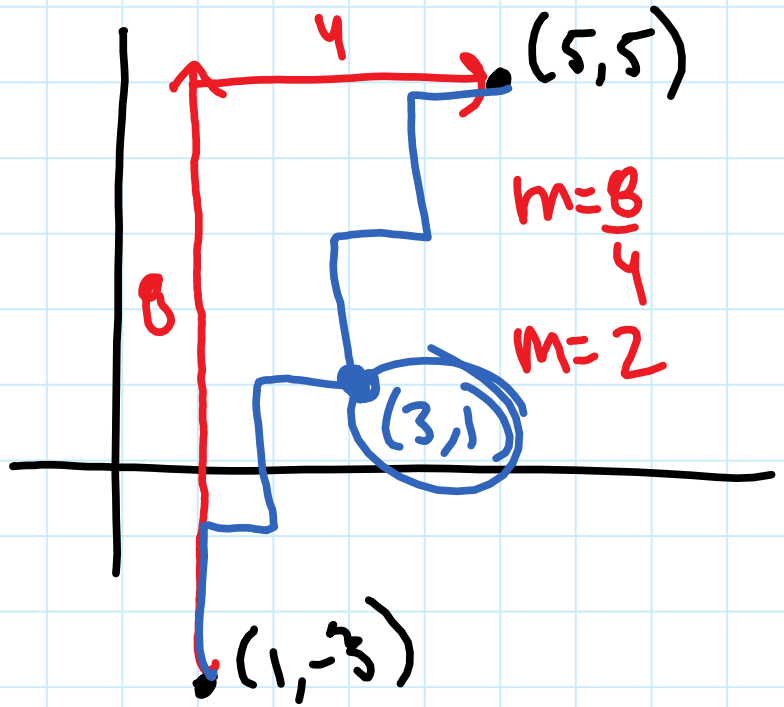
$$M = (3, 2)$$



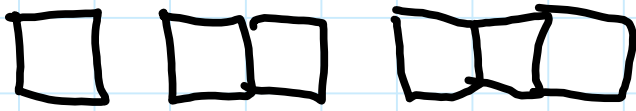
b) (1,-3) (5,5)

$$M = \left(\frac{1+5}{2}, \frac{-3+5}{2} \right)$$

$$M = (3, 1)$$



30)



Let $t = \#$ TOOTPICKS
 Let $d = \text{diagram \#}$

$(1, 4)$ $(2, 7)$

$$m = \frac{7-4}{2-1}$$

$$m = 3$$

$$y = mx + b$$

$$y = 3x + b \quad (1, 4)$$

$$4 = 3(1) + b$$

$$4 = 3 + b$$

$$\begin{array}{r} -3 \\ -3 \end{array}$$

$$1 = b$$

$$y = 3x + b$$

$$t = 3d + 1$$

d	t
1	4
2	7
3	10
4	13
5	16

~~$t = d + 3$~~

$$t = 3d + 1$$

b) $t = 3d + 1$
 $t = 3(5) + 1$
 $t = 16$

c) $t = 13$
 $t = 3d + 1$
 $13 = 3d + 1$
 $\begin{array}{r} -1 \\ -1 \end{array}$
 $12 = 3d$
 $\frac{12}{3} = \frac{3d}{3}$
 $d = 4$