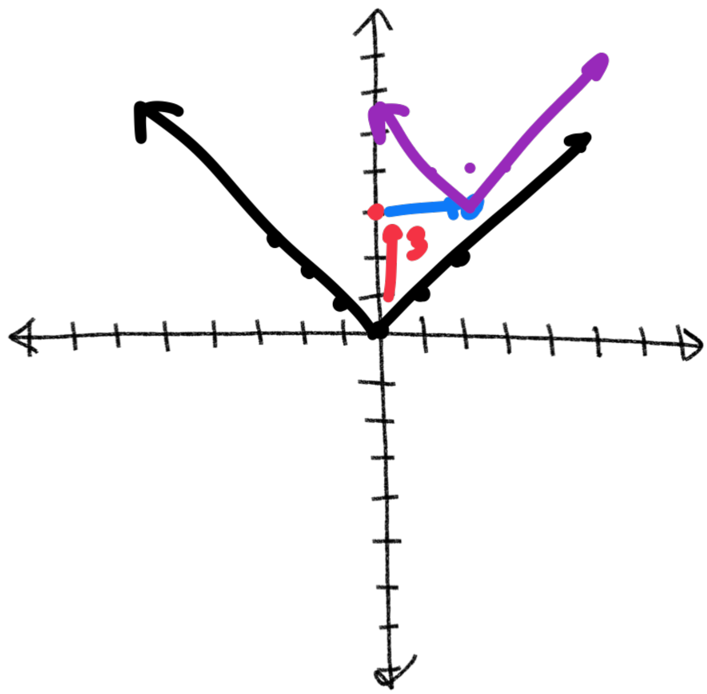
S-A2 Algebra 2 Session 11 7/16

$y = |x \underbrace{-2}_{\text{Right 2}}| \boxed{+3}$

(opposite)

up 3

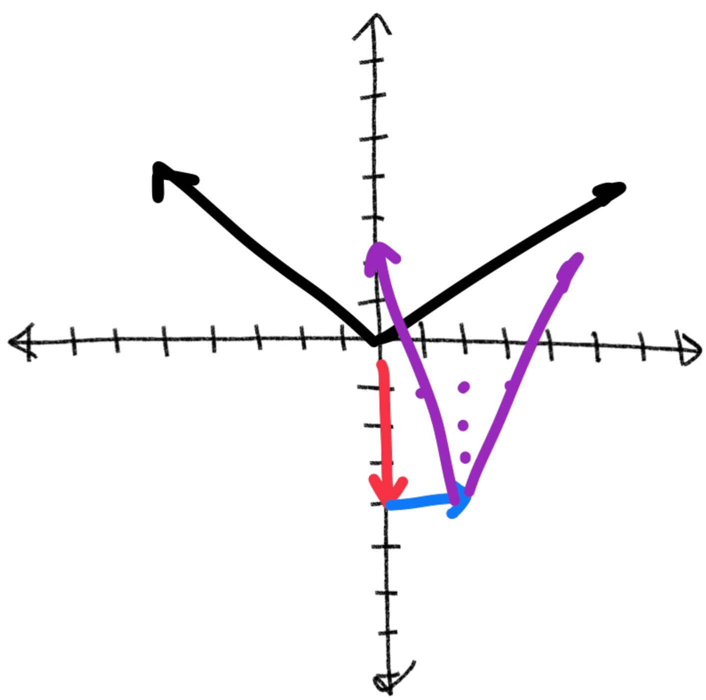


$y = \left| \frac{3x}{3} - \frac{6}{3} \right| - 4$

$|3(x \underbrace{-2}_{\text{Right 2}})| \underbrace{-4}_{\text{down 4}}$

slope

$\frac{\text{up } 3}{1 \text{ over}}$



$$y = -\left|\frac{5x}{5} - \frac{15}{5}\right| + 2$$

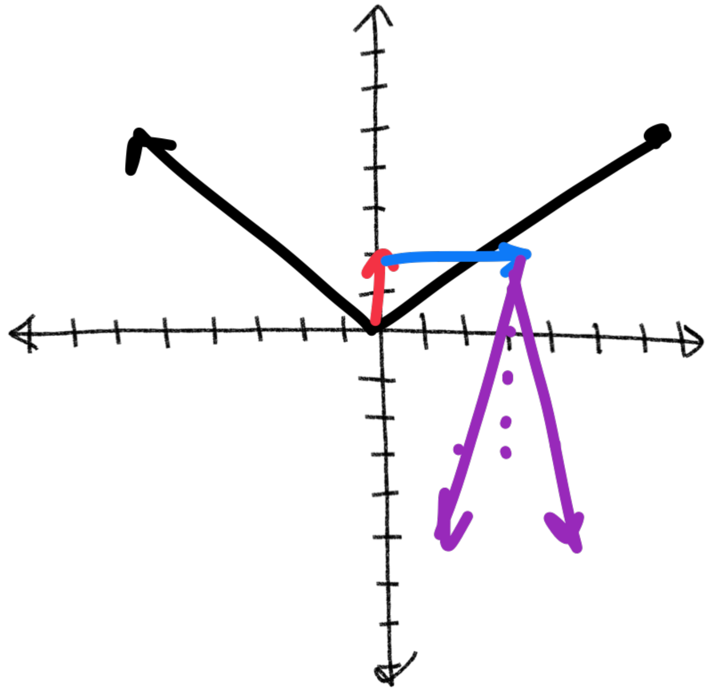
$$= -\left|\underbrace{5}_{\text{5 down / 1 over}}(x \underbrace{-3}_{\text{Right 3}})\right| \underbrace{+2}_{\text{2 up}}$$

flip

$\frac{\text{5 down}}{\text{1 over}}$

Right 3

2 up

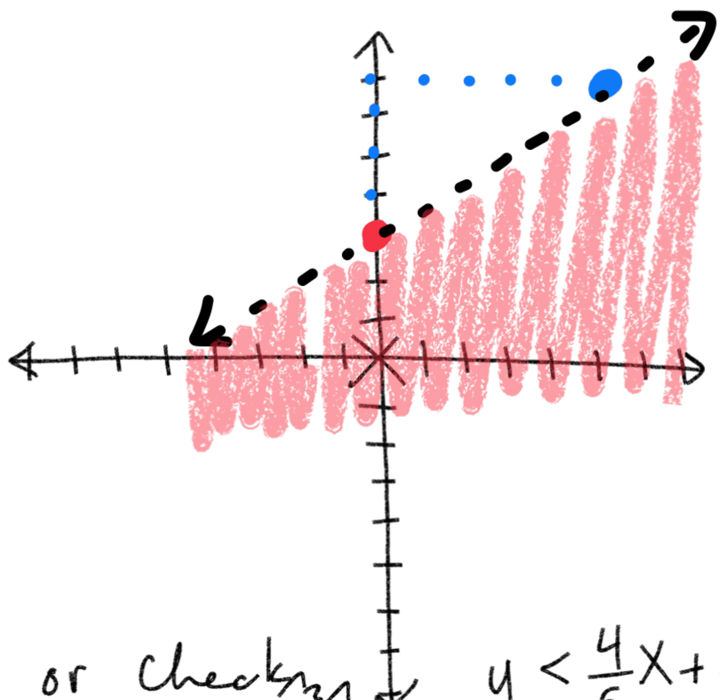


dashed

$$y \underbrace{<}_{\text{dashed}} \underbrace{\frac{4}{5}}_{\text{Use slope}}x + \underbrace{3}_{\text{y-int}}$$

Use slope

$$\frac{4}{5} = \frac{\text{up } 4}{\text{right } 5}$$



For shading...

$>$ up↑ $<$ down↓

or checking with $\{(0,0)\}$

$$y < \frac{4}{5}x + 3$$

$$0 < \frac{4}{5}(0) + 3$$

true $0 < 3$

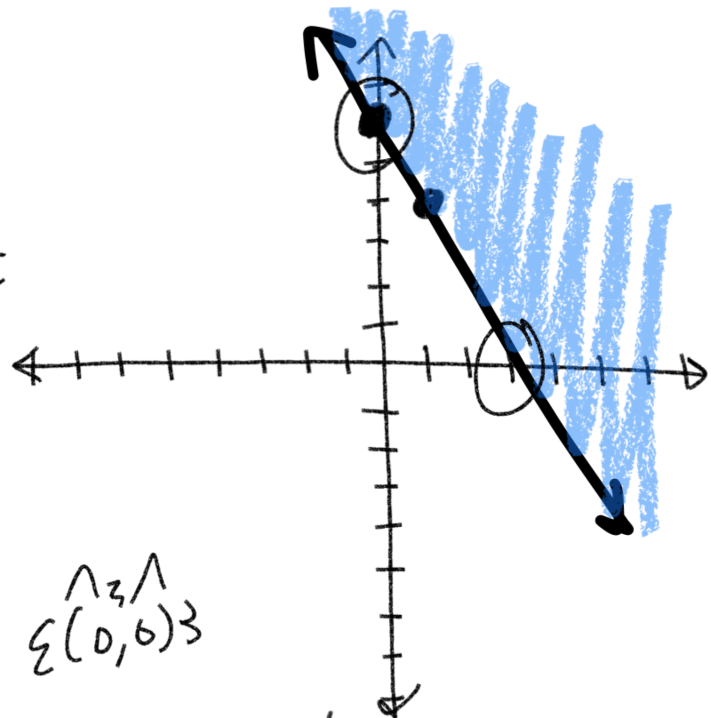
$$6x + 3y \geq 18$$

Option #1: Convert to slope-intercept

$$6x + 3y \geq 18$$
$$-6x \qquad\qquad -6x$$

$$\frac{3y}{3} \geq \frac{-6x}{3} + \frac{18}{3}$$

$$y \geq -2x + 6$$



$\{(0,0)\}$

$$y \geq -2x + 6$$
$$0 \geq -2(0) + 6$$
$0 \geq 6$ false

Option #2: Kill/Use Intercepts

$$\cancel{6x} + \left[\frac{3y}{3} = \frac{18}{3}\right]$$

$x = 0$

$y = 6 \qquad (0,6)$

$$\frac{6x}{6} + \cancel{3y} = \frac{18}{6}$$

$x = 3 \qquad (3,0)$

$f(3)$ make $x=3$

Algebra 2 Chapter 2 Pre-Test

1.) (8 pts total, 4 pts each) For the following function, determine $f(3)$ and $f(-2)$.

a) $\boxed{f(x) = x^2 - 4x + 5}$

Make sure you do both!

$f(3) = (3)^2 - 4(3) + 5 = 9 - 12 + 5$

$-3 + 5 = 2$

$f(3) = \boxed{2}$

$f(-2) = (-2)^2 - 4(-2) + 5$

b) $f(x) = \frac{5x-6}{2x}$

2.) (8 pts total, 4 pts each) Suppose $\boxed{f(x) = 3x - 5}$ and $\boxed{g(x) = x^2 + 6}$

a) Find $\frac{g(3)}{f(2)}$.

For what value(s) of x would $\frac{g(x)}{f(x)}$ not be a function, if any.

Look for when the denominator equals Ø.

$$\frac{g(3) = (3)^2 + 6}{f(2) = 3(2) - 5} = \frac{9+6}{6-5} = \frac{15}{1} = \boxed{15}$$

$\frac{g(x)}{f(x)} \leftarrow$ cannot be Ø

b) $\boxed{\text{Find } f(-1) \cdot g(0)}$

For what value(s) of x would $f(x) \cdot g(x)$ not be a function, if any.

this one is good

$f(x) \neq 0$

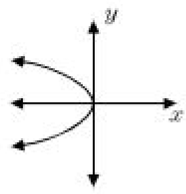
$3x - 5 \neq 0$

$f(-1) * g(0)$

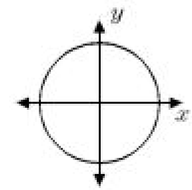
$(3(-1) - 5)((0)^2 + 6)$

3.) (8 pts total, 2 pts each) Which of the following graphs represents a function? Write either “function” or “not a function”.

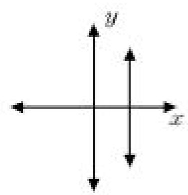
a)



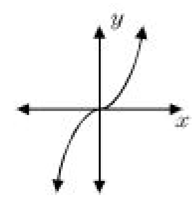
b)



c)



d)



4.) (8 pts total, 4 pts each) Write the equation for the line formed by each slope and point. Include both slope-intercept and ~~point-slope forms~~.

a) (-2, 4), m = -3

plug into $y = mx + b$

b) (0, -5), m = ½

Please do not just convert into $y = mx+b$

5.) (8 pts total, 4 pts each) Find the slope and intercepts for each of the following lines:

a) 4x + 6y = -12

x-int & y-int

slope →

x-int →

y-int →

b) $\boxed{7x - 2y = 10}$

$\frac{7x}{7} \cancel{-2y} = \frac{10}{7}$

x-int (kill y)

$x = \frac{10}{7}$

6.) (8 pts total, 4 pts each) Find the slope for each of the following:

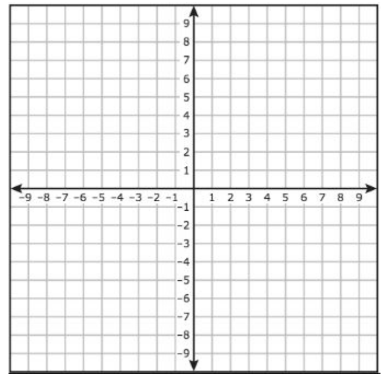
a) (-5, 3) and (7, -1)

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

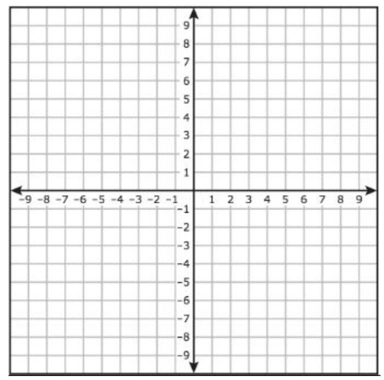
b) (-2, 6) and (4, -9)

7.) (8 pts total, 4 pts each) Graph each of the following equations:

a) $5x - 10y = 20$ No shading



b) $16x + 8y = 48$



8.) (8 pts total, 4 pts each) Determine the equation for each of the following:

a) Write the equation for a line through (-2, 7) and perpendicular to y = -2x + 5.

perpendicular slopes → opposite inverses

$$\boxed{y = \frac{1}{2}x + 8}$$

1.) Find given slope $\frac{-2}{1}$

b) Write the equation for a line parallel to y = 3x - 2 that passes through (1, -3)

$y = -2x + 5$

Given slope $= \frac{-2}{1}$

2.) Needed slope

$\frac{-2}{1} \rightarrow$ opp $\frac{2}{1} \rightarrow$ inverse $\frac{1}{2}$

3.) $y = mx + b$

$7 = (\frac{1}{2})(-2) + b$

$7 = -1 + b$

$+1 \quad +1 \quad 8 = b$

9.) (8 pts total, 4 pts each) Each of the following depicts a direct variation function. For each, find the constant of variation and show the relationship in an equation.

a) If y = 12 when x = 3

$y = kx$ $k = \frac{y}{x}$

Find y when x = 9

1.) Find k

2.) Find $y = kx$

3.) Solve for either x or y

b) If y = -6 when x = 15

Find x when y = 2

10.) (8 pts total, 4 pts each) For each of the following, determine whether y varies directly with x. If so, find the constant of variation and write the equation.

k $y = kx$

a)

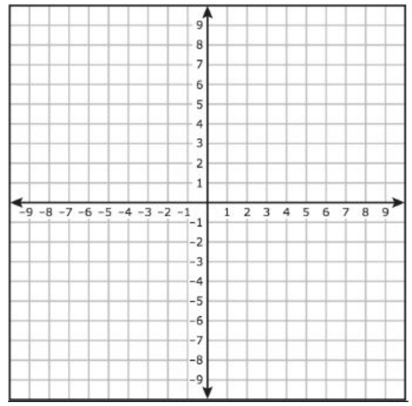
x	y
-1	-4
2	8
3	12

b)

x	y
-3	9
0	1
1	4

11.) (6 pts total, 3 pts each) For each of the following, find the vertex of the absolute value function. Then graph the function.

a) $f(x) = |2x + 3| - 5$



Keep, change, flip!

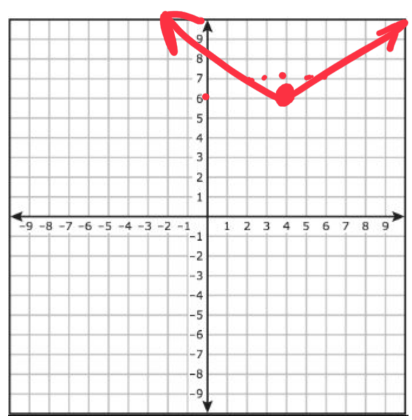
$2 \div \frac{1}{2}$

$\frac{2}{1} * \frac{2}{1} = \frac{4}{1} = 4$

b) $f(x) = |1/2x - 2| + 6$

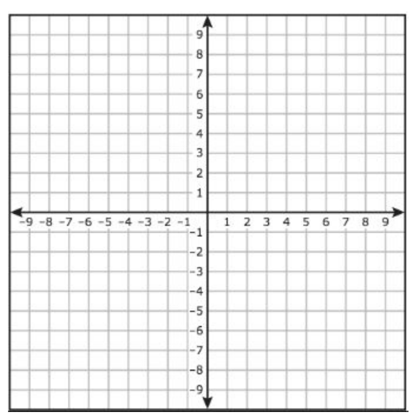
$\frac{1}{2}$ $\frac{1}{2}$

$y = \left|\frac{1}{2}(x - 4)\right| + 6$



12.) (6 pts total, 3 pts each) For each of the following, find the vertex of the absolute value function. Then graph the function.

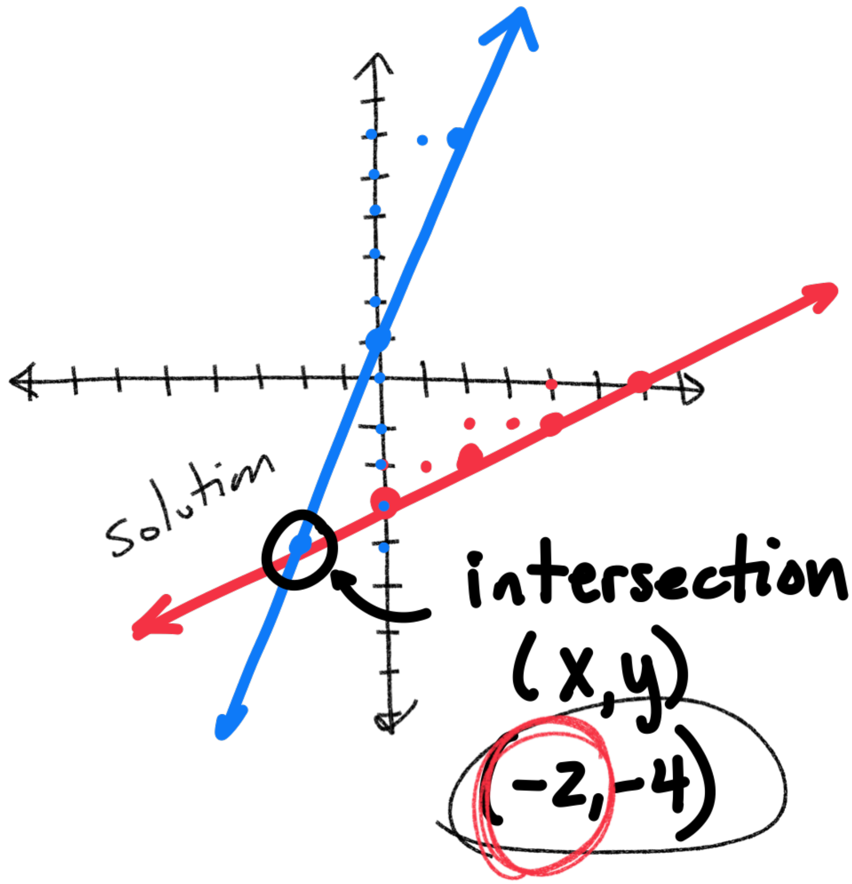
a) $f(x) = |x - 6|$



Systems of Equations

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

$$\boxed{y = \frac{5}{2}x + 1}$$



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

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

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

$-1 - 3 = -4$

$y = \frac{5}{2}x + 1$

$g(x) = \frac{5}{2}x + 1$

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

$-5 + 1 = -4$

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

$$+3 \qquad\qquad +3$$

$$\frac{1}{2}x = \frac{5}{2}x + 4$$

$$-\frac{5}{2}x \qquad -\frac{5}{2}x$$

$$-\frac{4}{2}x = 4$$

$$\frac{-2x}{-2} = \frac{4}{-2}$$

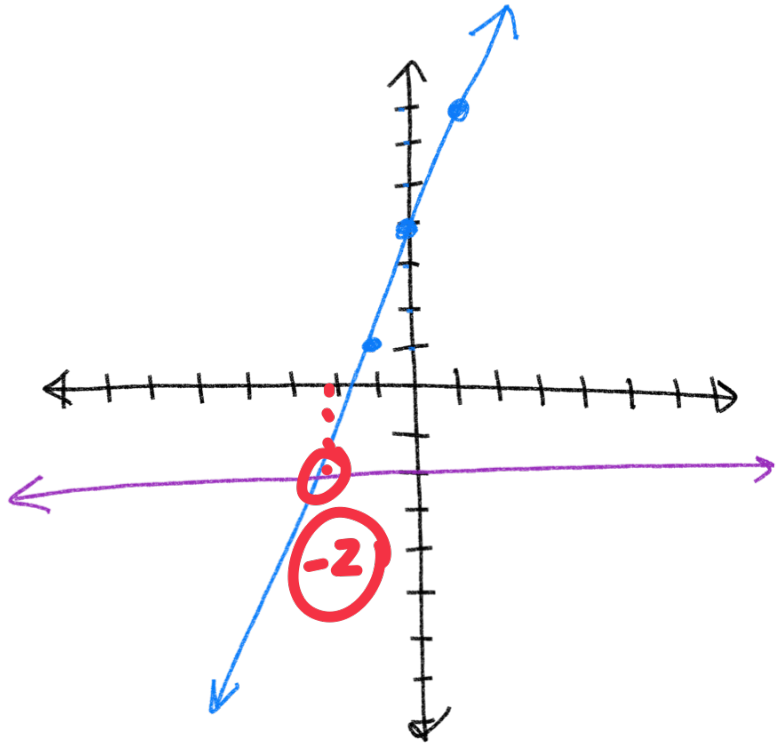
$$x = -2$$

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

$$\quad -4 \qquad -4$$

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

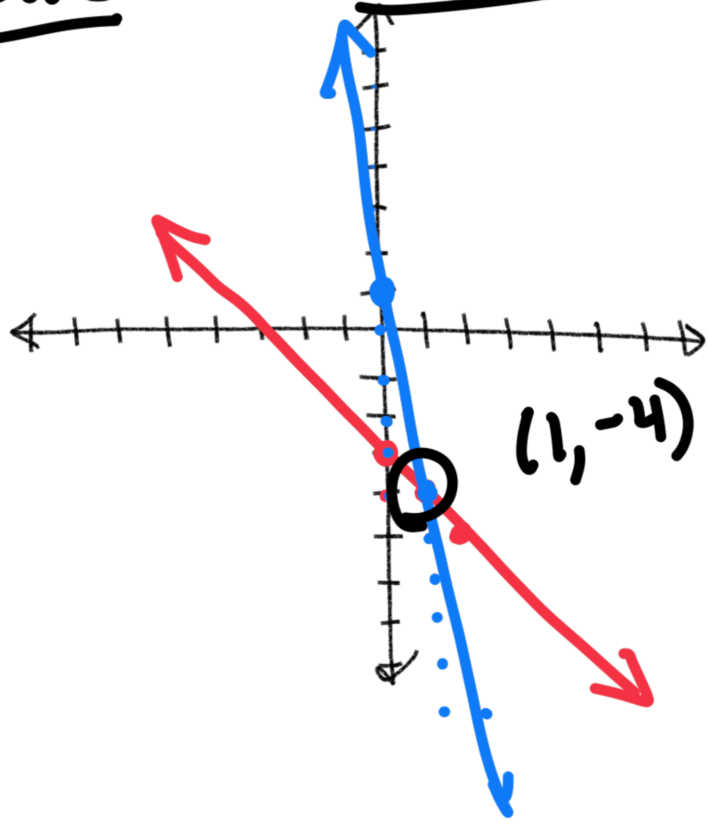
$$\boxed{x=-2}$$



$$\boxed{y=-x-3}$$

$$\boxed{y=-5x+1}$$

Answer → Intersection

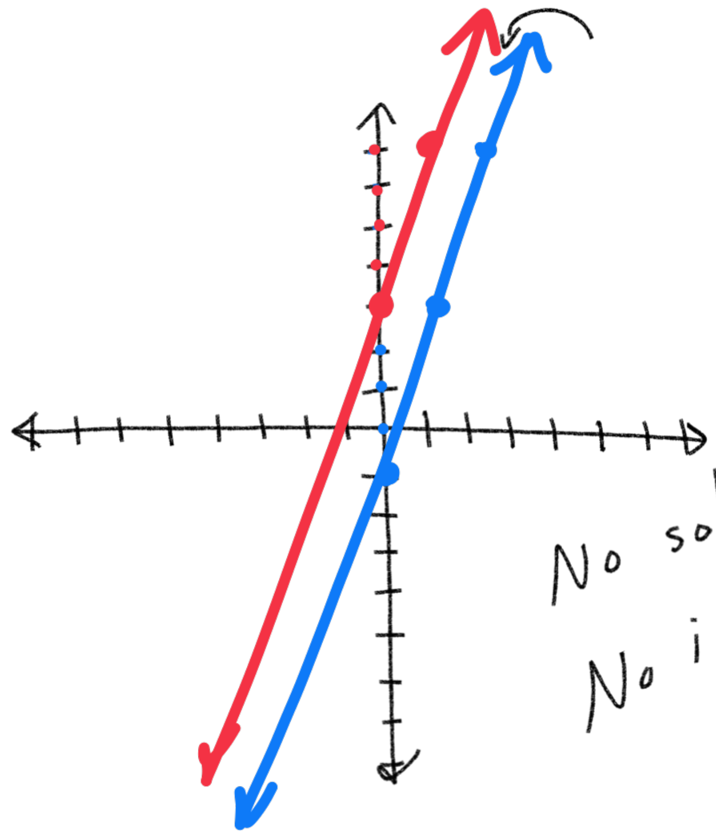


$$\boxed{y = 4x + 3}$$

$$\boxed{y = 4x - 1}$$

parallel

same slope



No solution!

No intersect

$$4x + 3 = 4x - 1$$
$$-4x \qquad -4x$$

$$3 = -1$$
$$-3 \qquad -3$$

$$\boxed{0 = 4}$$ No solution