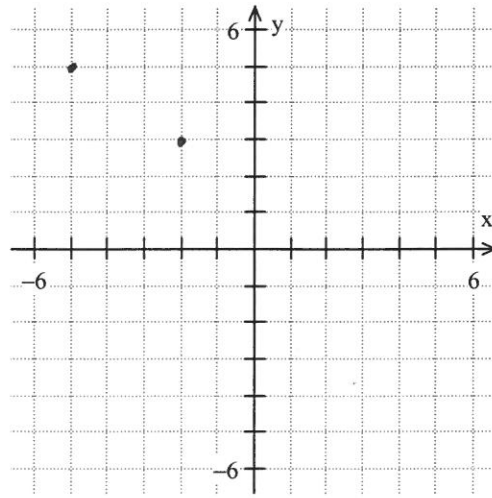


1) Complete the table for  $2x + 3y = 5$  and plot the points.

| x  | y |
|----|---|
| -2 | 3 |
| -5 | 5 |

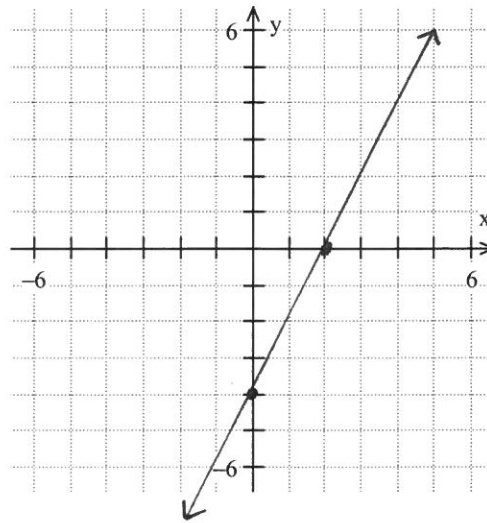
$$\begin{aligned} \text{if } y = 3 \\ 2x + 3(3) = 5 \\ 2x + 9 = 5 \\ 2x = -4 \\ x = -2 \quad (-2, 3) \end{aligned}$$

$$\begin{aligned} \text{if } x = -5 \\ 2(-5) + 3y = 5 \\ -10 + 3y = 5 \\ 3y = 15 \\ y = 5 \end{aligned}$$



2) Find the x- and y- intercepts of  $2x - y = 4$  and graph the equation

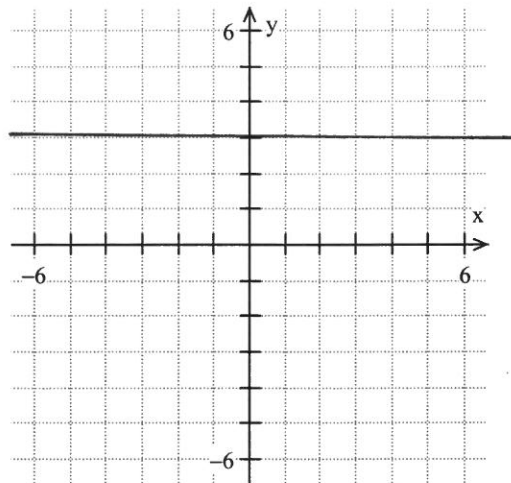
$$\begin{array}{l} \text{if } x = 0 \\ 2(0) - y = 4 \\ -y = 4 \\ y = -4 \\ (0, -4) \end{array} \quad \left| \quad \begin{array}{l} \text{if } y = 0 \\ 2x - 0 = 4 \\ 2x = 4 \\ x = 2 \\ (2, 0) \end{array} \right.$$



3) Graph the linear equation  $y = 3$ .

horizontal line

y is always 3



4) Find the slope of the line passing through  $(-4, 5)$  and  $(-5, 8)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 5}{-5 - (-4)} = \frac{8 - 5}{-5 + 4} = \frac{3}{-1} = -3$$

5) Any line perpendicular to  $y = 3x + 18$  must have slope  $-\frac{1}{3}$ .

(negative reciprocal)

6) What is the slope of the line  $-4x + 2y = 8$

$$2y = 8 + 4x$$

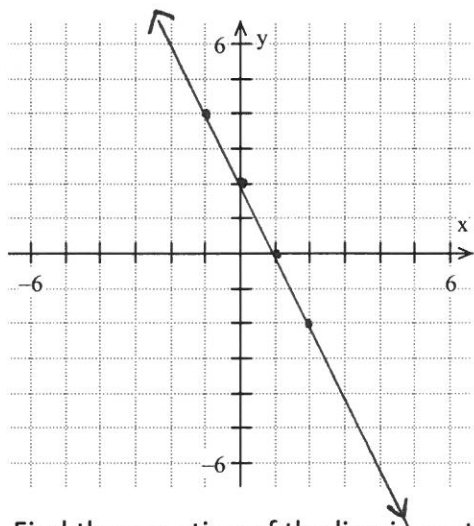
$$y = \frac{1}{2}(8 + 4x)$$

$$y = \frac{8}{2} + \frac{4}{2}x$$

$$y = 4 + 2x$$

$$m = 2$$

7) a) Graph the line through  $(-1, 4)$  with slope  $-2$ .



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

down 2, right 1

b) Find the equation of the line in part a) Give your answer in both slope-intercept form and standard form.

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

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

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

$$y - 4 = -2x - 2$$

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

$$y = -2x + 2$$

Slope-intercept form

Standard Form

$$2x + y = 2$$

8) Find the equation of a line passing through  $(1, 4)$  with undefined slope.

Undefined slope means line is vertical

equation  $x = 1$



9) Write an equation of the line through (4,2) parallel to  $3x - y = 2$

Slope must be the same as the given line

$$\begin{aligned} -y &= 2 - 3x \\ y &= -1(2 - 3x) \\ y &= -2 + 3x \\ \text{slope } &3 \end{aligned}$$

ANSWER:  $y - y_1 = m(x - x_1)$   
 $y - 2 = 3(x - 4)$   
 $y - 2 = 3x - 12$   
 $y = 3x - 10$

10) Solve each inequality. Give the solution in both interval and graph forms.

a)  $\frac{3x-1}{4} > 5$

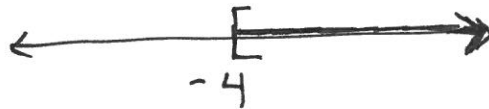
$$4\left(\frac{3x-1}{4}\right) > 4 \cdot 5$$

$$\begin{aligned} 3x - 1 &> 20 \\ 3x &> 21 \\ x &> 7 \\ (7, \infty) \end{aligned}$$



b)  $x - 3(x+1) \leq 5$

$$\begin{aligned} x - 3x - 3 &\leq 5 \\ -2x - 3 &\leq 5 \\ -2x &\leq 8 \quad \swarrow \text{flip} \\ \frac{-1}{2}(-2x) &\geq \frac{-1}{2}(8) \\ x &\geq -4 \\ [-4, \infty) \end{aligned}$$



c)  $-12 \leq -3x + 6 \leq 15$

$$\begin{aligned} -6 &\quad -6 \\ -18 &\leq -3x \leq 9 \\ \frac{-18}{-3} &\geq x \geq \frac{9}{-3} \quad \swarrow \text{flip} \\ 6 &\geq x \geq -3 \\ \text{same as} \\ -3 &\leq x \leq 6 \\ [-3, 6] \end{aligned}$$



11) Let  $A = \{1, 2, 3, 4, 5, 6\}$  and  $B = \{3, 5, 7\}$

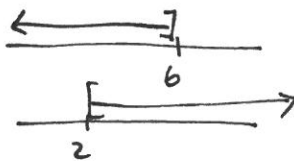
a)  $A \cup B = \{1, 2, 3, 4, 5, 6, 7\}$

b)  $A \cap B = \{3, 5\}$

12) Solve the inequality. Give the solution set in both interval and graph forms

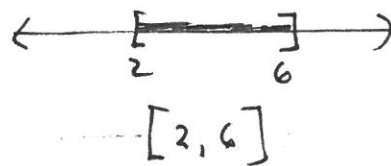
a)  $x + 5 \leq 11$  and  $x - 3 \geq -1$

$x \leq 6$  and  $x \geq 2$



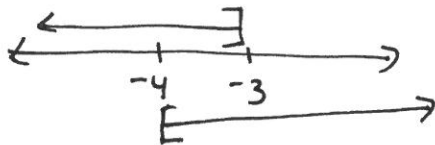
intersect

ANSWER



b)  $3x + 2 \leq -7$  or  $-2x + 1 \leq 9$

$3x \leq -9$      $-2x \leq 8$   
 $x \leq -3$  OR  $-\frac{1}{2}(-2x) \geq (\frac{1}{2})(8)$   
 $x \geq -4$

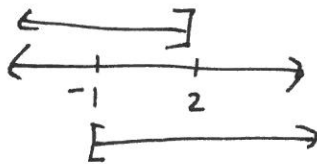


union

ANSWER  
 $(-\infty, \infty)$



c)  $x < 2$  or  $x > -1$



union

ANSWER  
 $(-\infty, \infty)$

