

Name: _____

Date: _____

Period: _____

KEY

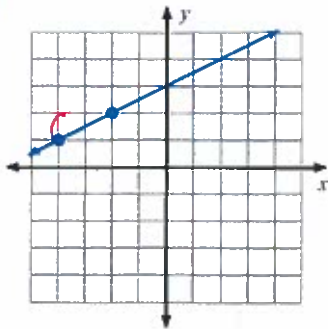
Unit #3: Slope and Graphing Linear Equations and Inequalities

<u>Slope and Rate of Change</u>	I can... <ul style="list-style-type: none">- Determine the slope of a line given: a table, graph, 2 points, or an equation- Calculate the rate of change of a graph/table and explain in words what the rate of change means in a word problem
<u>Graphing and Identify the Attributes of Linear Functions</u>	I can... <ul style="list-style-type: none">- Graph a linear function given the equation in $y=mx + b$- Identify these key features: x-intercepts, y-intercepts, zeros, and slope
<u>Transforming Linear Equations and Graphing Linear Equations</u>	I can... <ul style="list-style-type: none">- Transform equations from standard form to slope-intercept form- Graph equations after transforming them into slope-intercept form
Linear <u>Inequalities</u> and their <u>Solution Sets</u>	I can... <ul style="list-style-type: none">- Graph a linear inequality (given in slope-intercept form or standard form)- Determine whether a point is in the solution set

Slope and Rate of Change

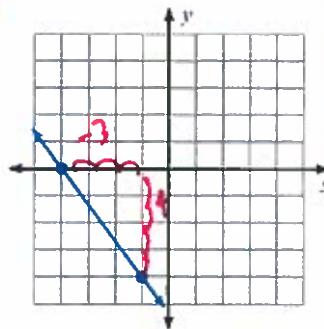
Find the slope of each line.

1)



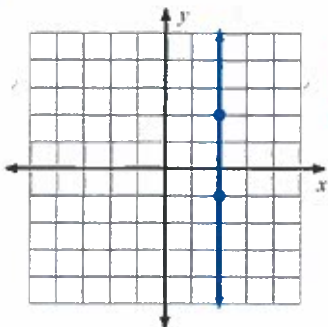
$\frac{1}{2}$

2)



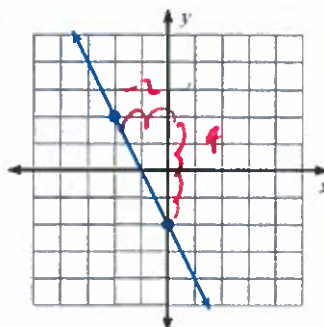
$\frac{4}{-2} = -2$

3)



undefined

4)



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

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

Find the slope of the line through each pair of points.

5) $(-11, 4), (13, 16)$

$$\frac{16 - 4}{13 - (-11)} = \frac{12}{24} = \frac{1}{2}$$

6) $(1, -13), (-2, 8)$

$$\frac{8 - (-13)}{-2 - 1} = \frac{21}{-3} = -7$$

7) $(15, 4), (13, 6)$

$$\frac{6 - 4}{13 - 15} = \frac{2}{-2} = -1$$

8) $(20, 4), (20, -19)$

$$\frac{-19 - 4}{20 - 20} = \frac{-23}{0} = \text{undefined}$$

9) $(-17, 11), (-16, 11)$

$$\frac{11 - 11}{-16 - (-17)} = \frac{0}{1} = 0$$

10) $(-19, 19), (6, 4)$

$$\frac{4 - 19}{6 - (-19)} = \frac{-15}{25} = -\frac{3}{5}$$

Find the slope of each line.

11) $y = x - 1$

1

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

$-\frac{2}{3}$

1. The table shows the linear relationship between the balance of a student's savings account and the number of weeks he has been saving.

Savings Account

Week	0	1	3	6	8	13
Balance (dollars)	32	39	53	74	88	123

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

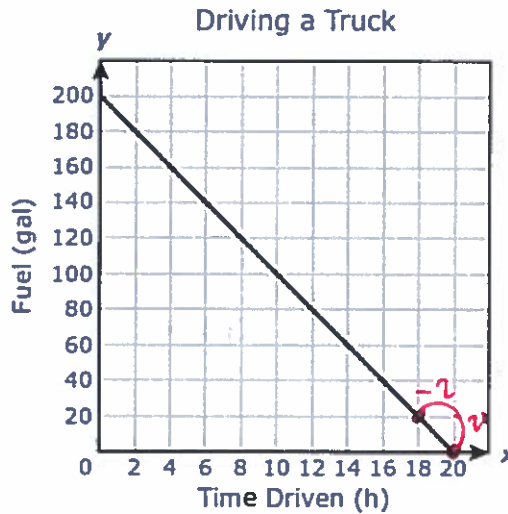
$\frac{7}{1} = ?$

What is the rate of change: 7

What does the rate of change represent in this situation?

\$7 added each week

2. The graph below shows the relationship between the number of gallons of fuel remaining in a truck and the number of hours the truck has been driven.



$$\frac{20}{2} = 10$$

What is the rate of change: -10

What does the rate of change represent in this situation?

 every hour uses 10 gallons of fuel

- 3.

x	Months of Service	2	4	6	8	10	12
y	Total Cost (dollars)	9,378	12,806	16,234	19,662	23,090	26,518

What is the rate of change: 1714

$$\frac{3428}{2} = 1714$$

What does the rate of change represent in this situation?

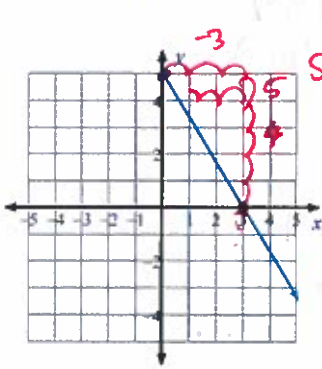
 It costs \$1,714 every month of service

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

Graphing and Identify the Attributes of Linear Functions

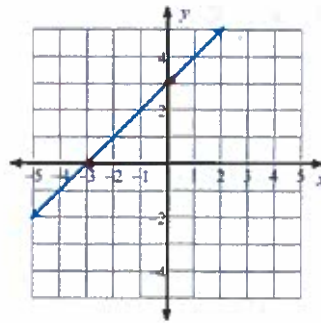
Determine the type of slope (positive/negative), the slope, x-intercept/zero, and y-intercept of each linear graph.

1)



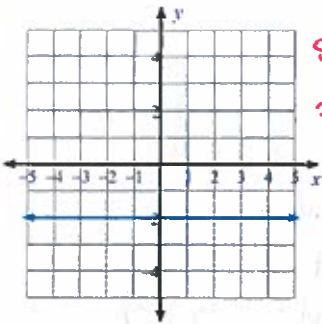
Slope = $\frac{5}{3}$
 negative
 X-int: (3, 0)
 y-int: (0, 5)

2)



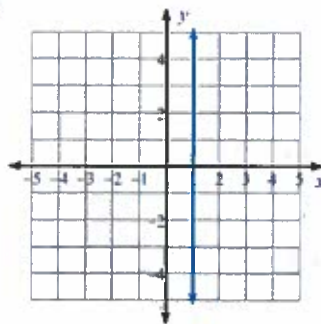
Slope = $\frac{1}{1} = 1$
 positive
 X-int: (-3, 0)
 y-int: (0, 3)

3)



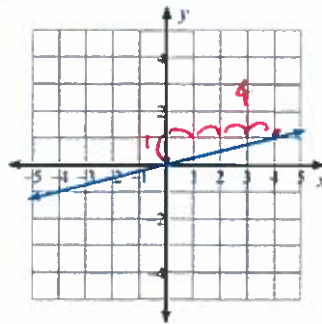
Slope: 0
 zero slope
 X-int: ~~(0, 0)~~ none
 y-int: (0, -2)

4)



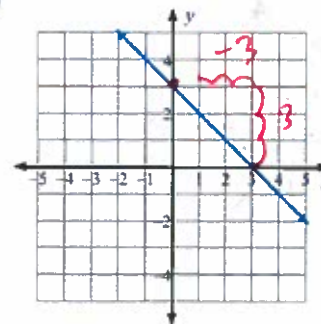
Slope: undefined
 undefined
 X-int: (1, 0)
 y-int: none

5)



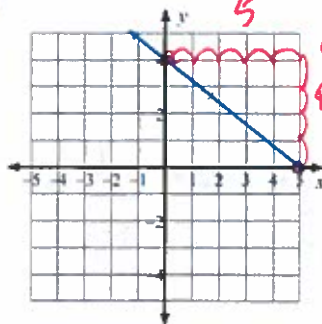
Slope: $\frac{1}{4}$
 positive slope
 X-int: (4, 0)
 y-int: (0, 1)

6)



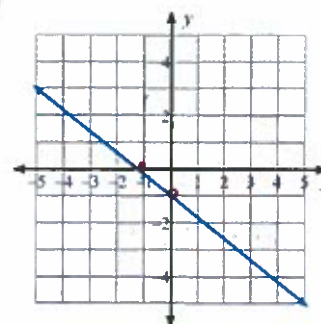
Slope: -1
 negative
 X-int: (3, 0)
 y-int: (0, 3)

7)

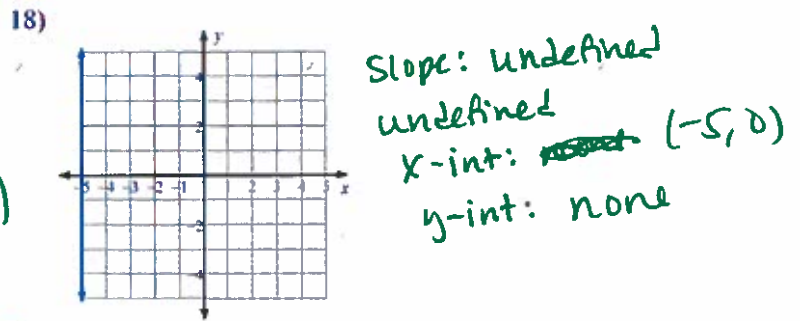
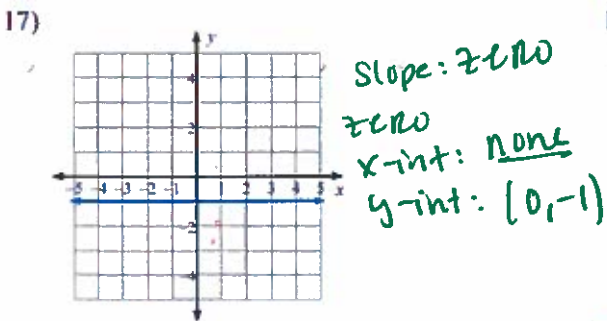
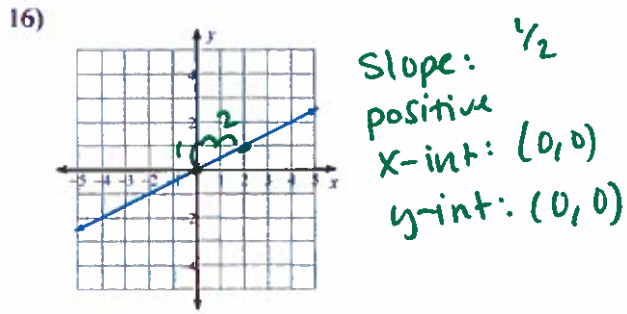
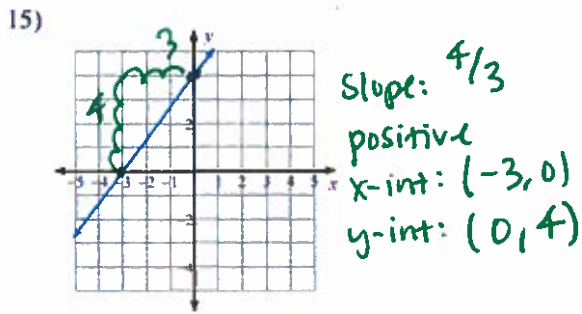
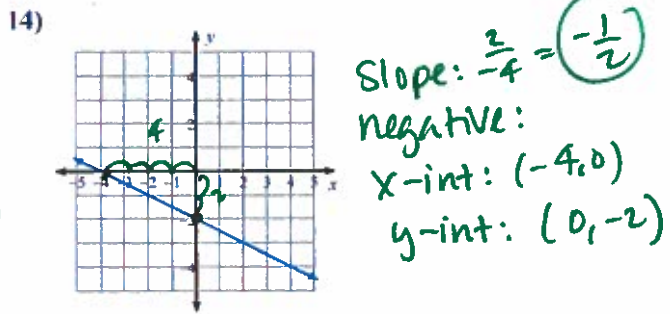
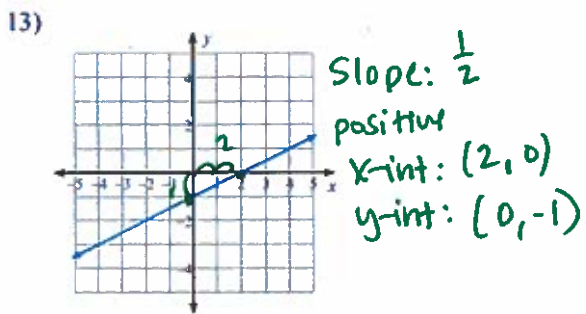
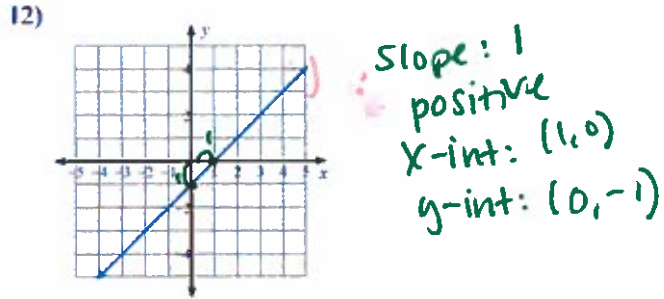
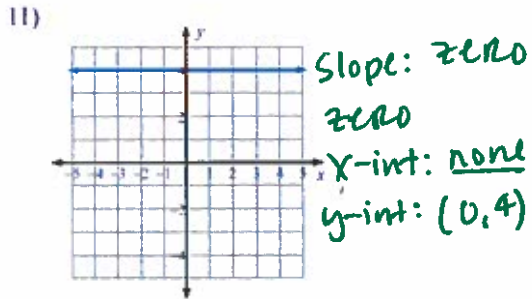
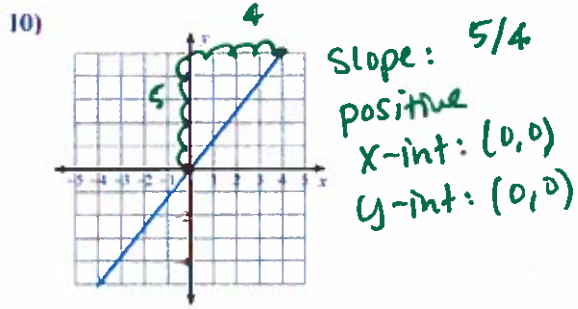
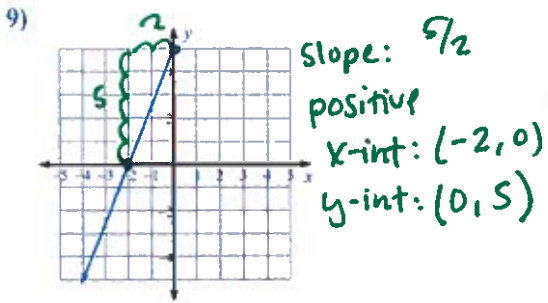


Slope: $-\frac{4}{5}$
 negative
 X-int: (5, 0)
 y-int: (0, 4)

8)



Slope: -1
 negative
 X-int: (-1, 0)
 y-int: (0, -1)



Transforming Linear Equations and Graphing Linear Equations

$$y = mx + b$$

Write the slope-intercept form of the equation of each line.

$$1) \begin{array}{l} 8x + 5y = -20 \\ -8x \quad | \quad -8x \\ \hline 5y \quad | \quad -8x - 20 \\ \hline \frac{5y}{5} \quad | \quad \frac{-8x - 20}{5} \end{array}$$

$$y = -\frac{8}{5}x - 4$$

$$2) \begin{array}{l} 1x - 5y = -40 \\ -1x \quad | \quad -1x \\ \hline -5y \quad | \quad -1x - 40 \\ \hline \frac{-5y}{-5} \quad | \quad \frac{-1x - 40}{-5} \end{array}$$

$$y = \frac{1}{5}x + 8$$

$$3) \begin{array}{l} 4x + 5y = -5 \\ -4x \quad | \quad -4x \\ \hline 5y \quad | \quad -4x - 5 \\ \hline \frac{5y}{5} \quad | \quad \frac{-4x - 5}{5} \end{array}$$

$$y = -\frac{4}{5}x - 1$$

$$4) \begin{array}{l} 4x + y = -29 \\ -4x \quad | \quad -4x \\ \hline y \quad | \quad -4x - 29 \\ \hline \frac{y}{1} \quad | \quad \frac{-4x - 29}{1} \end{array}$$

$$y = -4x - 29$$

$$5) x - 4y = -32$$

A) $y = -\frac{5}{4}x + 8$

B) $y = \frac{5}{4}x + 8$

C) $y = 8x - \frac{5}{4}$

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

$$\frac{-4y}{-4} = \frac{-1x - 32}{-4}$$

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

$$6) 8x + 7y = -56$$

A) $y = -8x + \frac{8}{7}$

B) $y = 8x + \frac{8}{7}$

C) $y = -\frac{8}{7}x - 8$

D) $y = \frac{8}{7}x - 8$

$$\frac{7y}{7} = \frac{-8x - 56}{7}$$

$$y = -\frac{8}{7}x - 8$$

$$7) x + y = -1$$

A) $y = -x - 1$

B) $y = x - 3$

C) $y = -3x - 1$

D) $y = -x - 3$

$$y = -x - 1$$

$$8) 3x - 8y = 24$$

A) $y = -\frac{3}{8}x - 3$

B) $y = \frac{1}{4}x - 3$

C) $y = -\frac{1}{4}x - 3$

D) $y = \frac{3}{8}x - 3$

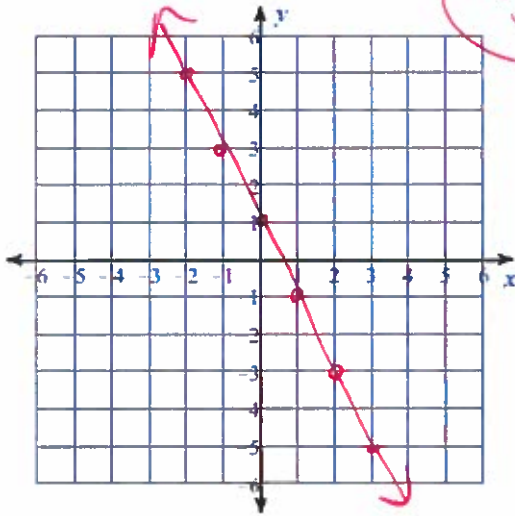
$$\frac{-8y}{-8} = \frac{-3x + 24}{-8}$$

$$y = \frac{3}{8}x - 3$$

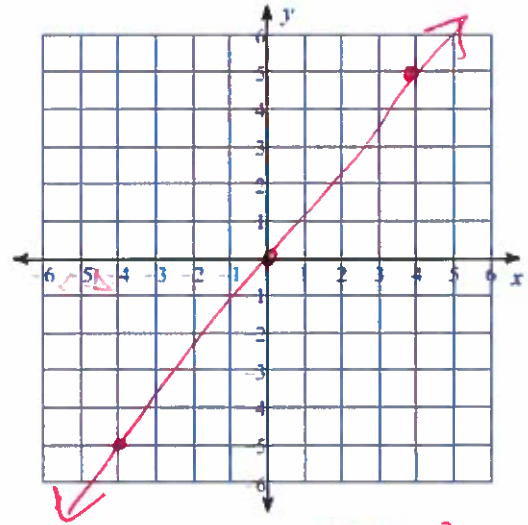
Sketch the graph of each line.

9) $2x + y = 1$

$y = -2x + 1$

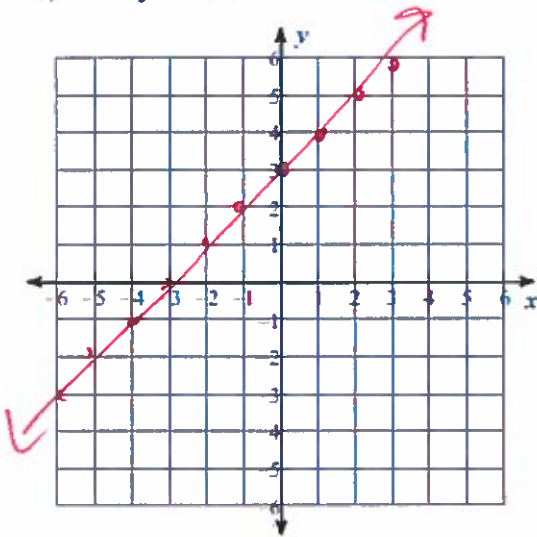


10) $5x - 4y = 0$



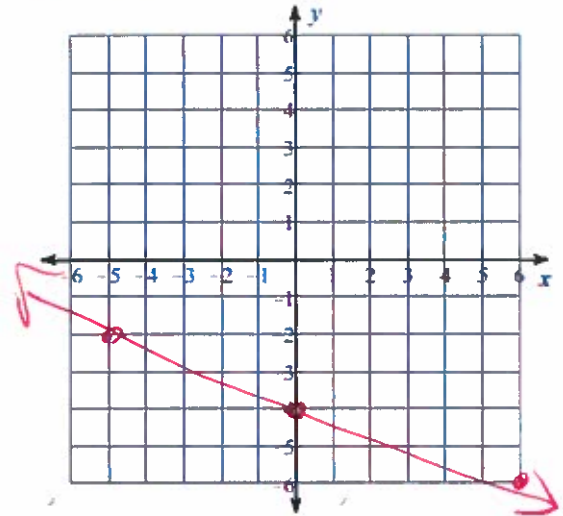
$$\begin{aligned} -4y &= \frac{-5x + 0}{-4} \\ y &= \frac{5}{4}x + 0 \end{aligned}$$

11) $x - y = -3$



$$\begin{aligned} -y &= \frac{-x - 3}{-1} \\ y &= x + 3 \end{aligned}$$

12) $2x + 5y = -20$

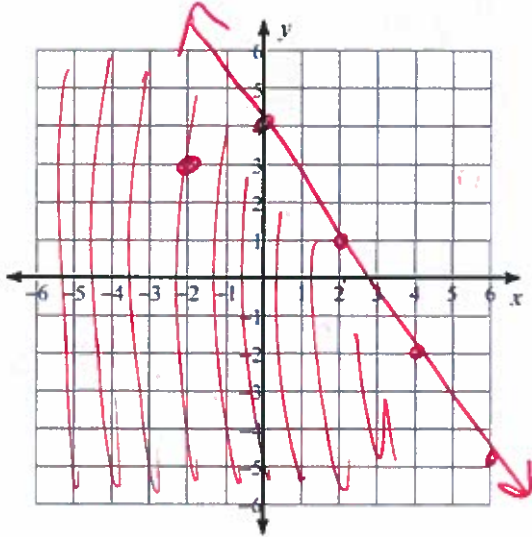


$$\begin{aligned} \frac{5y}{5} &= \frac{-2x - 20}{5} \\ y &= \frac{-2}{5}x - 4 \end{aligned}$$

Linear Inequalities and their Solution Sets

Graph each linear inequality and state whether the given point is in the solutions et.

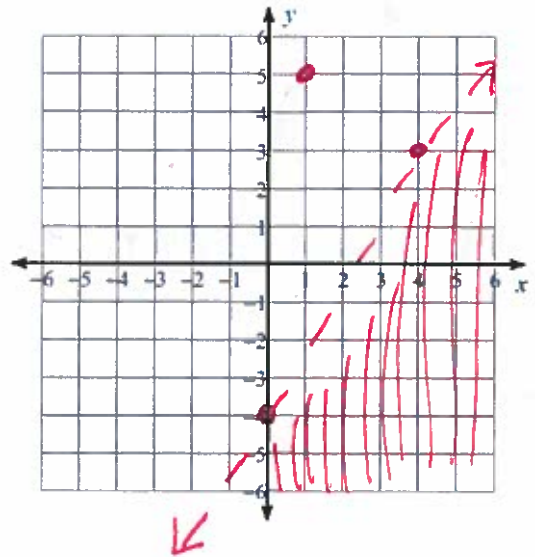
1) $y \leq -\frac{3}{2}x + 4$



Is the point (-2, 3) in the solution set?

Yes

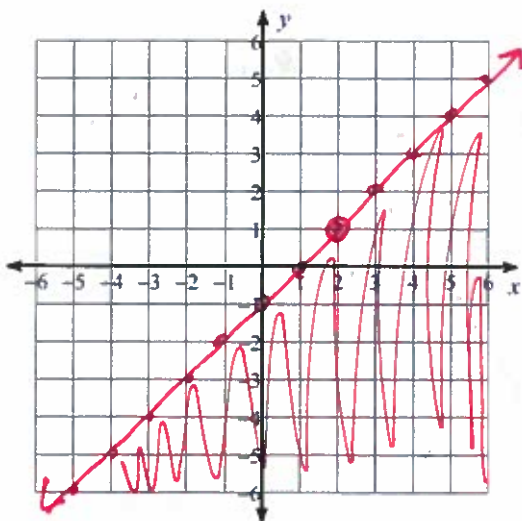
2) $y < \frac{7}{4}x - 4$



Is the point (1, 5) in the solution set?

NO

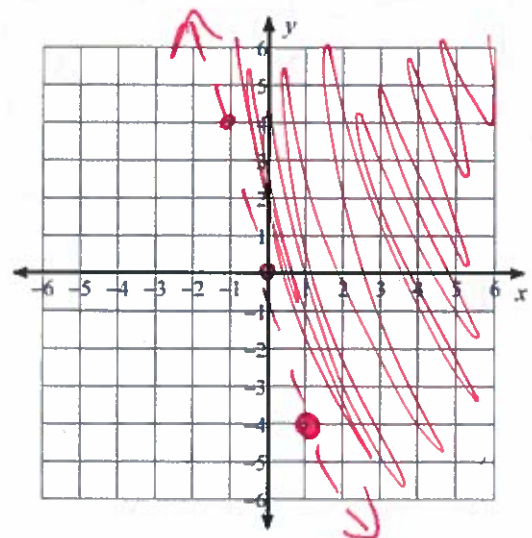
3) $y \leq x - 1$



Is the point (2, 1) in the solution set?

yes

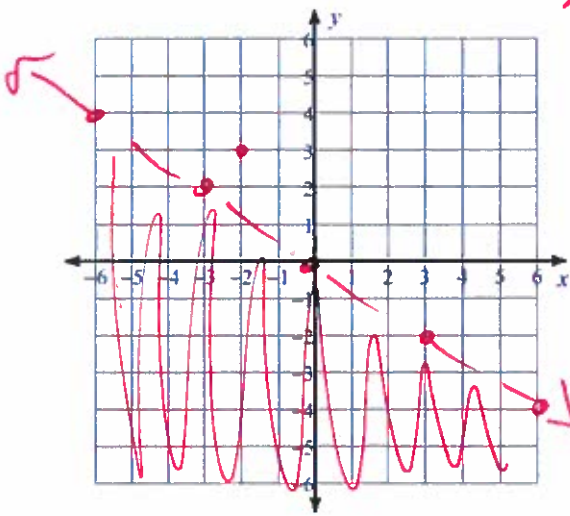
4) $y > -4x + 0$



Is the point (1, -4) in the solution set?

NO

5) $2x + 3y < 0$



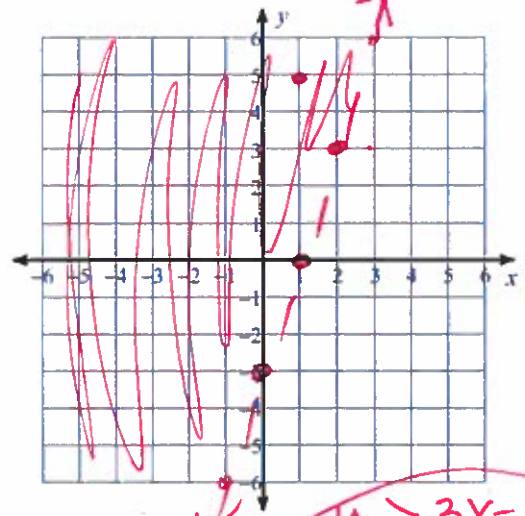
$$\frac{3y}{3} < \frac{-2x + 0}{3}$$

$$y < -\frac{2}{3}x + 0$$

Is the point $(-2, 3)$ in the solution set?

NO

6) $3x - y < 3$



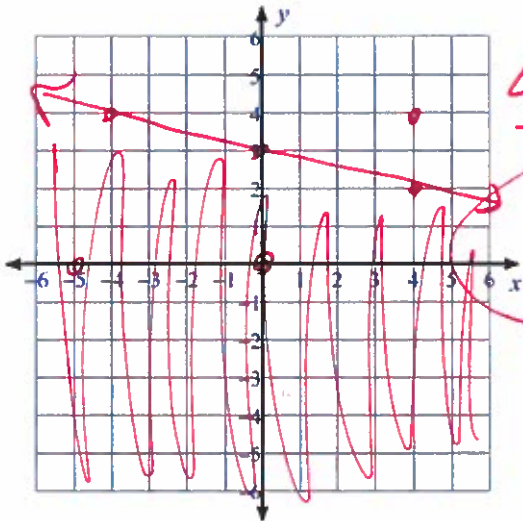
$$\frac{-y}{-1} < \frac{-3x + 3}{-1}$$

$$y > 3x - 3$$

Is the point $(1, 5)$ in the solution set?

yes

7) $x + 4y \leq 12$



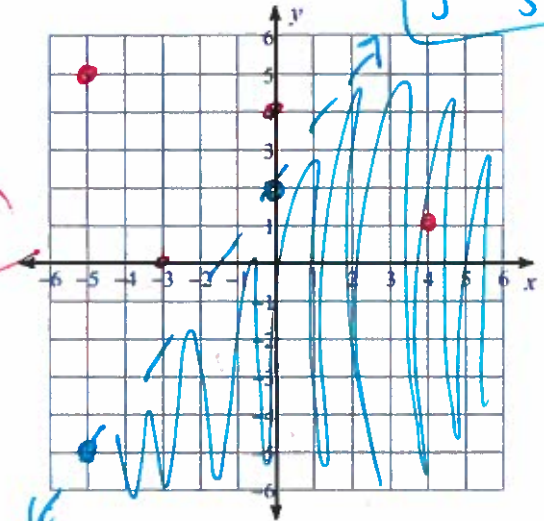
$$\frac{4y}{4} \leq \frac{-1x + 12}{4}$$

$$y \leq -\frac{1}{4}x + 3$$

Which of the following points are in the solution set?

- A. $(0, 0)$ ✓
- B. $(4, 4)$ ✗
- C. $(-5, 0)$ ✓
- D. $(4, 2)$ ✓

8) $7x - 5y > -10$



$$\frac{-5y}{-5} > \frac{-7x - 10}{-5}$$

$$y < \frac{7}{5}x + 2$$

Which of the following points are in the solution set?

- A. $(-5, 5)$ ✗
- B. $(4, 1)$ ✓
- C. $(-3, 0)$ ✗
- D. $(0, 4)$ ✗