

Standard & Point-Slope Forms - NOTES

Standard Form

1) General Standard Form:

$$Ax + By = C$$

$$\text{SLOPE} = -\frac{A}{B}$$

OPPOSITE OF SIGN IN EQUATION

Write the standard form of the equation of the line through the given point with the given slope.

2) through:  $(2, 3)$ , slope =  $\frac{1}{2}$

$$\begin{aligned} Ax + By &= C \\ 1x - 2y &= C \\ 1(2) - 2(3) &= C \\ 2 - 6 &= C \\ -4 &= C \end{aligned}$$

$$\boxed{1x - 2y = -4}$$

3) through:  $(3, -4)$ , slope =  $-\frac{7}{4}$

$$\begin{aligned} Ax + By &= C \\ 7x + 4y &= C \\ 7(3) + 4(-4) &= C \\ 21 - 16 &= C \\ 5 &= C \end{aligned}$$

$$\boxed{7x + 4y = 5}$$

4) through:  $(-3, -4)$ , slope =  $\frac{2}{3}$

$$\begin{aligned} 2x - 3y &= C \\ 2(-3) - 3(-4) &= C \\ -6 + 12 &= C \\ 6 &= C \end{aligned}$$

$$\boxed{2x - 3y = 6}$$

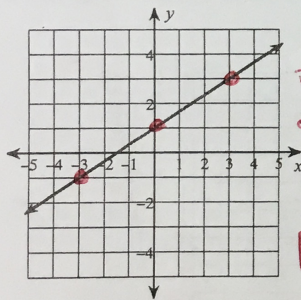
5) Slope =  $-\frac{6}{5}$ , y-intercept = 5

$$\begin{aligned} 6x + 5y &= C \\ 6(0) + 5(5) &= C \\ 0 + 25 &= C \\ 25 &= C \end{aligned}$$

$$\boxed{6x + 5y = 25}$$

Write the standard form of the equation of each line.

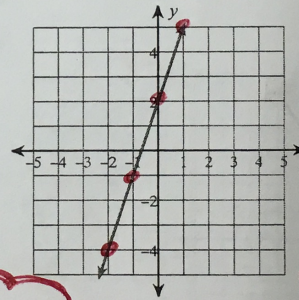
6)



$$\begin{aligned} \text{SLOPE} &= 1 \\ \text{POINT: } &(0, 1) \\ 1x - 1y &= C \\ 1(0) - 1(1) &= C \\ 0 - 1 &= C \\ -1 &= C \end{aligned}$$

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

7)

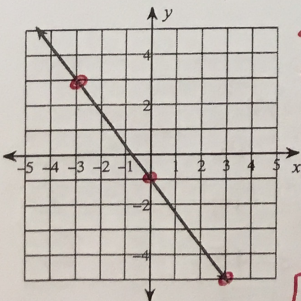


$$\begin{aligned} \text{SLOPE} &= -2 \\ \text{POINT: } &(1, 5) \\ 2x - 1y &= C \\ 2(1) - 1(5) &= C \\ 2 - 5 &= C \\ -3 &= C \end{aligned}$$

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

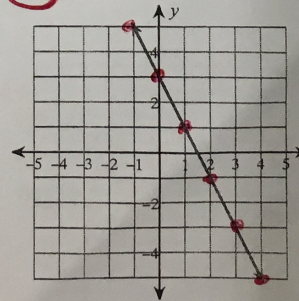
USE ANY POINT TO PLUG IN FOR X AND Y

8)



$$\begin{aligned} \text{SLOPE} &= -1 \\ \text{POINT: } &(-3, 3) \\ 1x + 1y &= C \\ 1(-3) + 1(3) &= C \\ -3 + 3 &= C \\ 0 &= C \end{aligned}$$

$$\boxed{1x + 1y = 0}$$

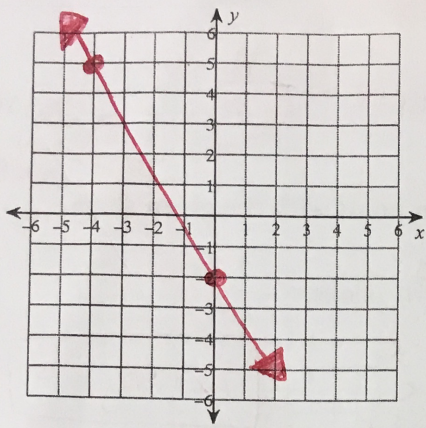


$$\begin{aligned} \text{SLOPE} &= -1 \\ \text{POINT: } &(1, 1) \\ 1x + 1y &= C \\ 1(1) + 1(1) &= C \\ 1 + 1 &= C \\ 2 &= C \end{aligned}$$

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

Sketch the graph of each line.

10)  $7x + 4y = -8$



\* SLOPE =  $-\frac{7}{4}$

\* y-INT (x=0):

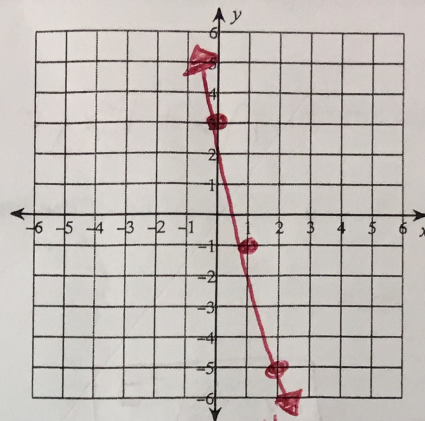
$$7(0) + 4y = -8$$

$$0 + 4y = -8$$

$$4y = -8$$

$$y = -2$$

11)  $4x + y = 3$



\* SLOPE =  $-\frac{4}{1}$

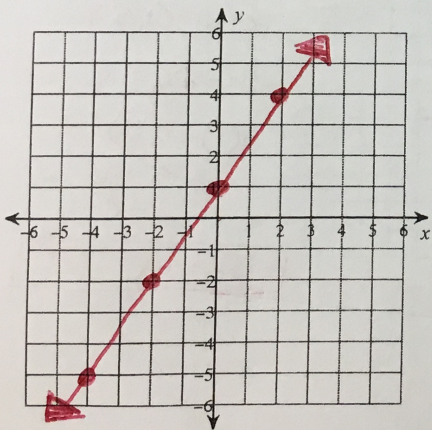
\* y-INT (x=0):

$$4(0) + y = 3$$

$$0 + y = 3$$

$$y = 3$$

12)  $3x - 2y = -2$



\* SLOPE =  $\frac{3}{2}$

\* y-INT (x=0):

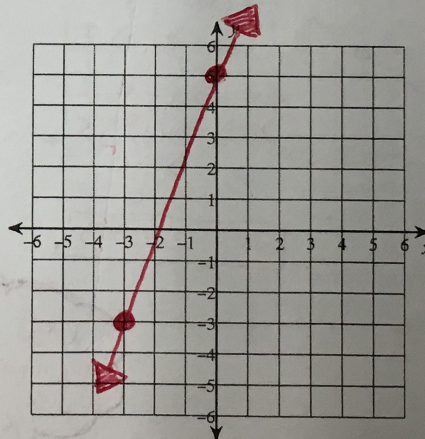
$$3(0) - 2y = -2$$

$$0 - 2y = -2$$

$$-2y = -2$$

$$y = 1$$

13)  $8x - 3y = -15$



\* SLOPE =  $\frac{8}{3}$

\* y-INT (x=0):

$$8(0) - 3y = -15$$

$$0 - 3y = -15$$

$$-3y = -15$$

$$y = 5$$

## Point-Slope Form

14) General Point-Slope Form:

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

↑  
SLOPE

POINT ON THE LINE:  $(x_1, y_1)$

Write the point-slope form of the equation of the line through the given point with the given slope.

15) through:  $(-4, 5)$ , slope =  $-\frac{1}{4}$

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

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

16) through:  $(3, -5)$ , slope =  $-\frac{1}{3}$

$$y - (-5) = -\frac{1}{3}(x - 3)$$

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

17) through:  $(-5, -4)$ , slope =  $\frac{8}{7}$

$$y - (-4) = \frac{8}{7}(x - (-5))$$

$$y + 4 = \frac{8}{7}(x + 5)$$

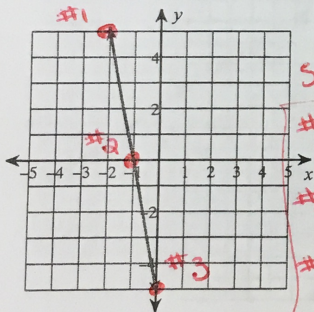
18) through:  $(-2, 5)$ , slope =  $-\frac{1}{7}$

$$y - 5 = -\frac{1}{7}(x - (-2))$$

$$y - 5 = -\frac{1}{7}(x + 2)$$

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

19)



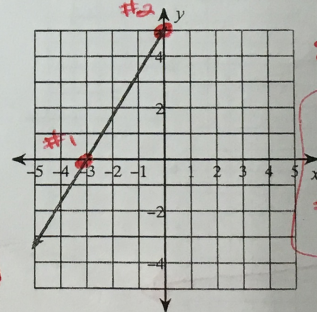
SLOPE =  $-\frac{5}{1} = -5$

#1:  $y - 5 = -5(x + 2)$

#2:  $y = -5(x + 1)$

#3:  $y + 5 = -5(x + 0)$

20)

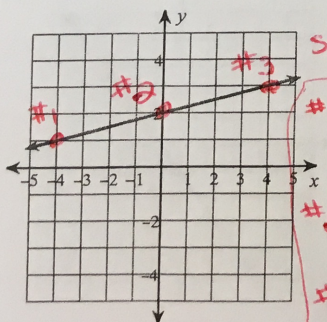


SLOPE =  $\frac{5}{3}$

#1:  $y = \frac{5}{3}(x + 3)$

#2:  $y - 5 = \frac{5}{3}(x + 0)$

21)



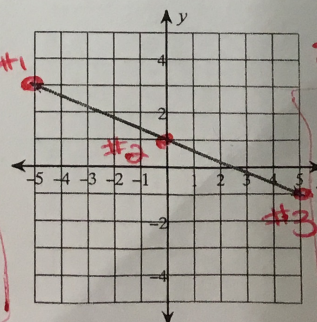
SLOPE =  $\frac{1}{4}$

#1:  $y - 1 = \frac{1}{4}(x + 4)$

#2:  $y - 2 = \frac{1}{4}(x + 0)$

#3:  $y - 3 = \frac{1}{4}(x - 4)$

22)



SLOPE =  $-\frac{2}{5}$

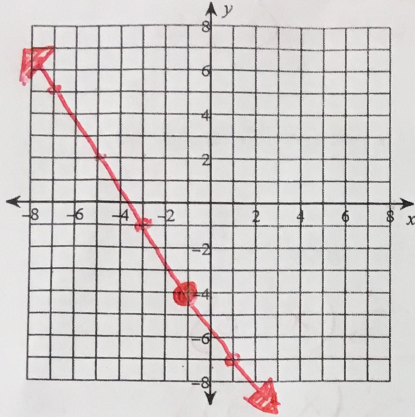
#1:  $y - 3 = -\frac{2}{5}(x + 5)$

#2:  $y - 1 = -\frac{2}{5}(x + 0)$

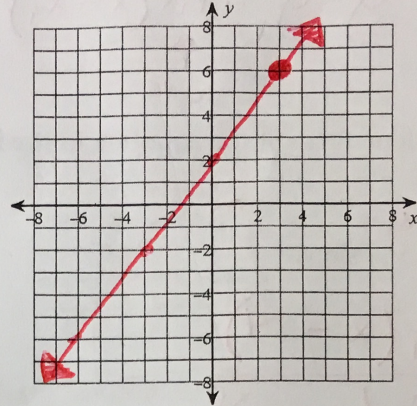
#3:  $y + 1 = -\frac{2}{5}(x - 5)$

Sketch the graph of each line.

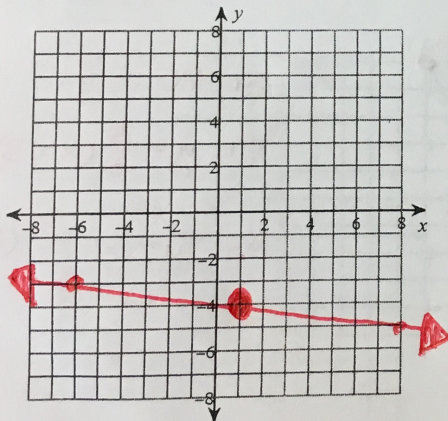
23)  $y + 4 = -\frac{3}{2}(x + 1)$  POINT:  $(-1, -4)$   
SLOPE:  $-\frac{3}{2}$



24)  $y - 6 = \frac{4}{3}(x - 3)$  POINT:  $(3, 6)$   
SLOPE:  $\frac{4}{3}$



25)  $y + 4 = -\frac{1}{7}(x - 1)$  POINT:  $(1, -4)$   
SLOPE:  $-\frac{1}{7}$



26)  $y - 1 = 6(x + 5)$  POINT:  $(-5, 1)$   
SLOPE:  $6 = \frac{6}{1}$

