

Name: \_\_\_\_\_

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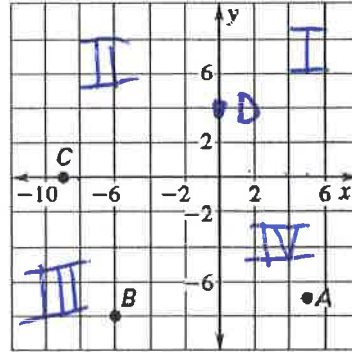
KEY

## Math Encounters Chapter 3 Review

Show all work for full credit.

1. Use the grid at the right to plot the given point and give the location (coordinates and the quadrant or axis) of each point that is already plotted on the graph.

Question	Point	Coordinates	Quadrant/Axis
a)	A	(5, -7)	IV
b)	B	(-6, -8)	III
c)	C	(-9, 0)	X-AXIS (NEGATIVE)
d)	Plot and label point D(0, 4) on the graph.		



2. Use the equation  $3x - 4y = 18$  to find the missing coordinates – showing all work

a.  $(6, 0)$

$$3x - 4(0) = 18$$

$$3x = 18$$

$$x = 6$$

b.  $(0, -\frac{9}{2})$

$$3(0) - 4y = 18$$

$$y = \frac{18}{-4} = -\frac{9}{2} = -4.5$$

c.  $(-\frac{10}{3}, -7)$

$$3x - 4(-7) = 18$$

$$3x + 28 = 18$$

$$\begin{array}{r} 3x + 28 = 18 \\ -28 \quad -28 \\ \hline 3x = -10 \\ x = -\frac{10}{3} \end{array}$$

3. Use the equation  $5x + 6y = 42$  to find the missing coordinates – showing all work

a.  $(0, 7)$

$$5(0) + 6y = 42$$

$$\frac{6y}{6} = \frac{42}{6}$$

$$y = 7$$

b.  $(0, 7)$

$$5x + 6(0) = 42$$

$$5x = 42$$

$$x = \frac{42}{5} = 8\frac{2}{5}$$

c.  $(\frac{18}{5}, 4)$

$$5x + 6(4) = 42$$

$$5x + 24 = 42$$

$$\begin{array}{r} 5x + 24 = 42 \\ -24 \quad -24 \\ \hline 5x = 18 \\ \frac{5x}{5} = \frac{18}{5} \end{array} \quad x = \frac{18}{5} = 3\frac{3}{5}$$

Find the intercepts of each line. Then graph each equation showing the intercepts.

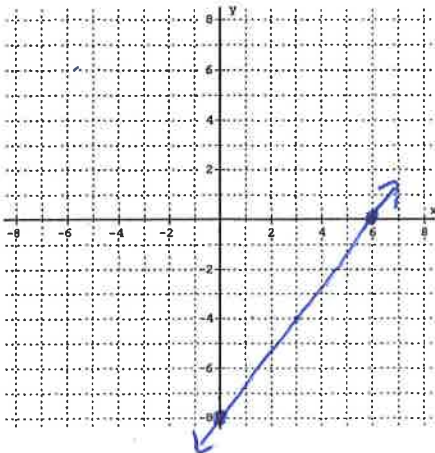
4.  $4x - 3y = 24$

a. x-int  $\frac{6}{1}$       y-int  $\frac{-8}{1}$

(y=0)  $4x = 24$       (x=0)  $-3y = 24$

$x = 6$        $y = -8$

b. Graph



5.  $8x - 32 = -16y$

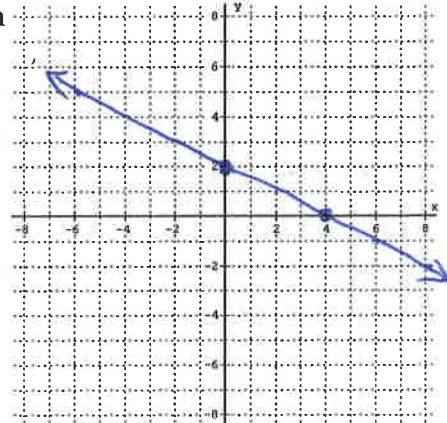
a. x-int  $\frac{4}{1}$       y-int  $\frac{2}{1}$

(y=0)  $8x - 32 = 0$       (x=0)  $-32 = -16y$

$8x = 32$        $\frac{-32}{-16} = \frac{-16y}{-16}$

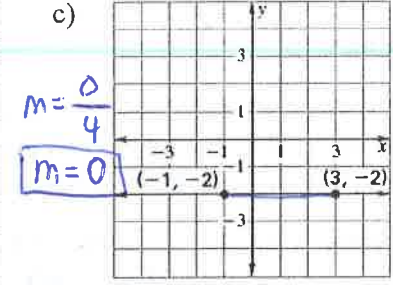
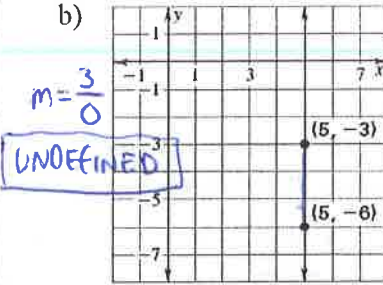
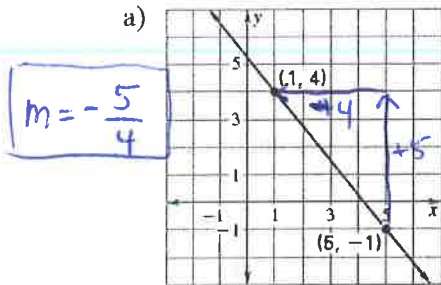
$x = 4$        $y = 2$

b. Graph



**Remember to reduce all slopes to the lowest possible improper fraction**

6. Find the slope of each line shown in the graphs



Find the slope of a line that passes through the points

7. (23, -14) and (-5, 7)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-14 - 7}{23 - (-5)} = \frac{-21}{28} = \boxed{-\frac{3}{4}}$$

8. (4, -6) and (4, 9)

$$m = \frac{-6 - 9}{4 - 4} = \frac{-15}{0} = \boxed{\text{UNDEFINED}}$$

9. (-5, 16) and (5, -8)

$$m = \frac{16 - (-8)}{-5 - 5} = \frac{24}{-10} = \boxed{-\frac{12}{5}}$$

Rewrite the following equations in slope-intercept form ( $y = mx + b$ ) *SOLVE FOR y*

10.  $5x + 2y = -8$

$$\begin{aligned} -5x & \quad -5x \\ \frac{2y}{2} &= \frac{-5x - 8}{2} \\ \boxed{y} &= \boxed{-\frac{5}{2}x - 4} \end{aligned}$$

11.  $-3x - 9y = 27$

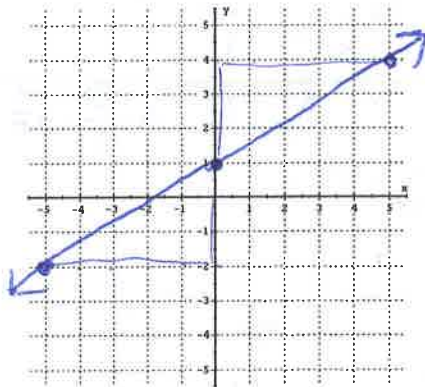
$$\begin{aligned} +3x & \quad +3x \\ \frac{-9y}{-9} &= \frac{3x + 27}{-9} \\ \boxed{y} &= \boxed{-\frac{1}{3}x - 3} \end{aligned}$$

12.  $6x + 8y = -20$

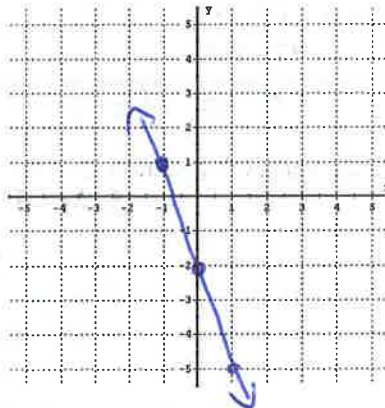
$$\begin{aligned} -6x & \quad -6x \\ \frac{8y}{8} &= \frac{-6x - 20}{8} \\ \boxed{y} &= \boxed{-\frac{3}{4}x - \frac{5}{2}} \end{aligned}$$

Graph the following equations on the provided graphs. Rewrite in slope-intercept form if necessary. Show at least three points of the graph for full credit.

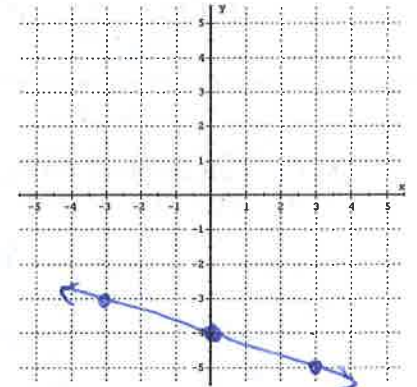
13.  $y = \frac{3}{5}x + 1$



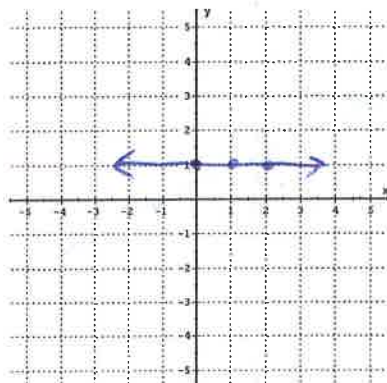
14.  $y = -3x - 2$



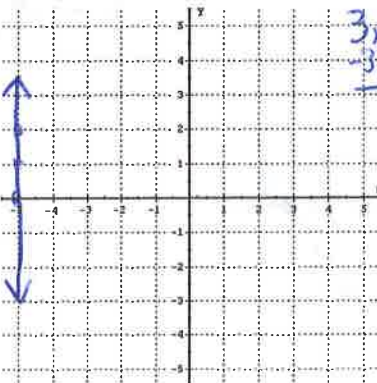
15.  $y = -\frac{1}{3}x - 4$



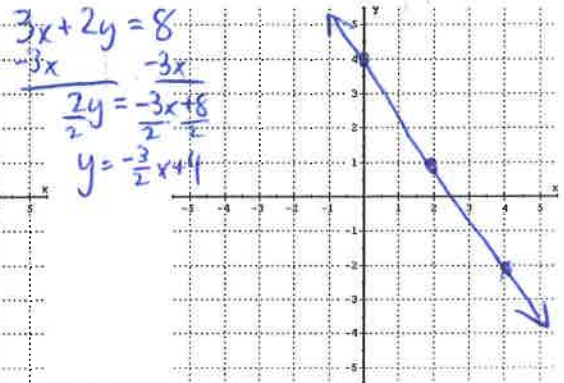
16.  $y = 1$



17.  $x = -5$

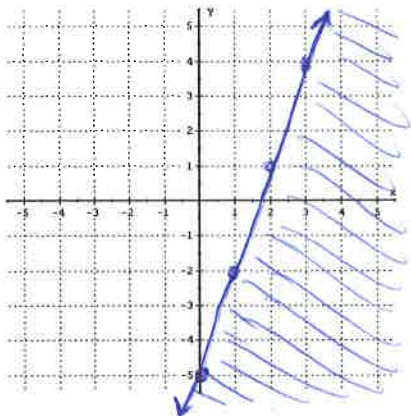


18.  $3x + 2y = 8$

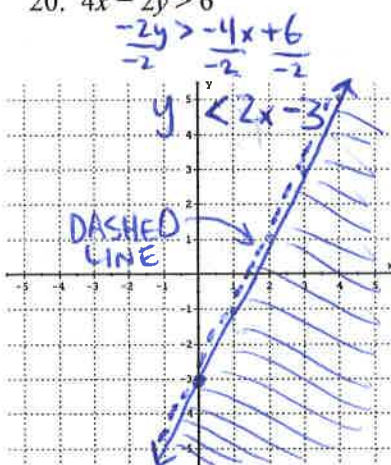


Graph the following inequalities on the provided graphs. Rewrite in slope-intercept form if needed, and remember to shade where necessary.

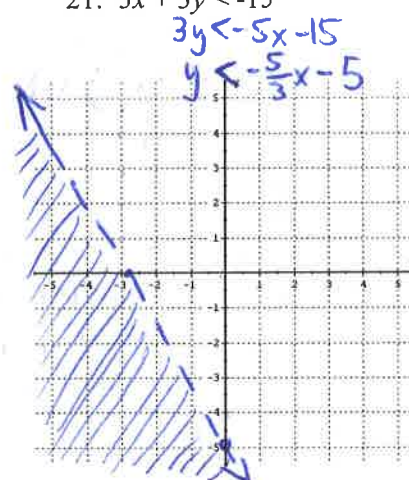
19.  $y \leq 3x - 5$



20.  $4x - 2y > 6$



21.  $5x + 3y < -15$



25. Use the scatterplot to draw in the line of best fit. Write an equation for the line of best fit.

$$m = \frac{10-4}{7-2} = \frac{6}{5}$$

$$y = mx + b$$

$$4 = \frac{6}{5}(2) + b$$

$$4 = \frac{12}{5} + b$$

$$b = \frac{8}{5}$$

$$y = 1.2x + 1.6$$

$$y = \frac{6}{5}x + \frac{8}{5}$$

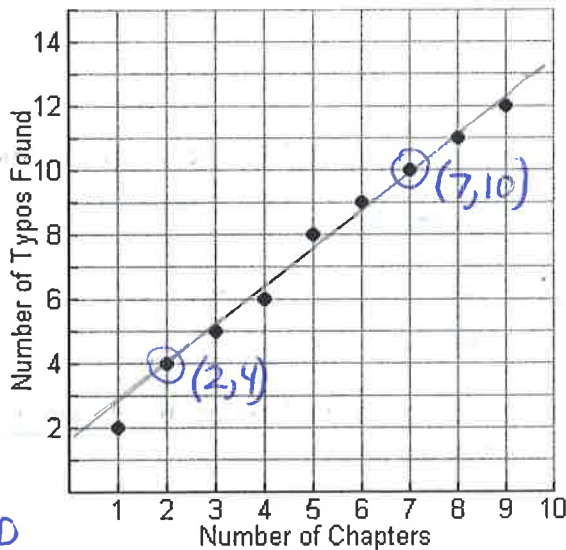
Use your equation to predict the number of typos for 10 chapters.  $x = 10$

$$y = 1.2(10) + 1.6$$

$$y = 12 + 1.6$$

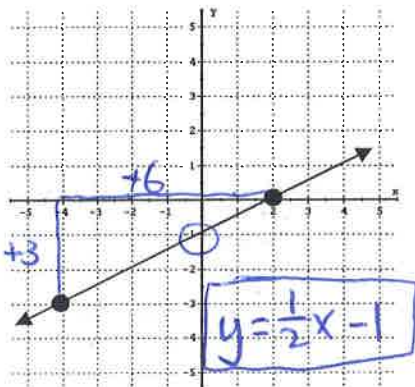
$$y = 13.6$$

APPROXIMATELY 14 TYPOS SHOULD BE FOUND IN 10 CHAPTERS

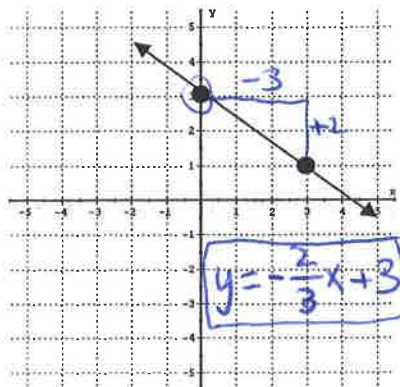


Write the equations of the line shown in each graph. Give all answers in slope-intercept form. (If there is no y-variable in the equation – then solve for x.)

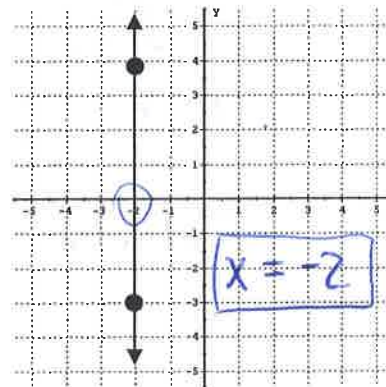
26.



27.



28.



Write the equations of the line described by the given information. Give all answers in slope-intercept form. (If there is no y-variable in the equation – then solve for x.)

29. Write the equation of the line that has a slope of  $-4$  that passes through the point  $(-2, 5)$ .

$$5 = -4(-2) + b$$

$$5 = 8 + b$$

$$\frac{-8}{-8} \quad \frac{-8}{-8}$$

$$-3 = b$$

$$y = -4x - 3$$

30. Write the equation of the line that has a slope of  $\frac{1}{3}$  that passes through the point  $(-6, -2)$ .

$$-2 = \frac{1}{3}(-6) + b$$

$$-2 = -2 + b$$

$$\frac{+2}{+2} \quad \frac{+2}{+2}$$

$$0 = b$$

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

31. Write the equation of the line that passes through the points  $(5, -4)$  &  $(-1, 8)$ .

$$m = \frac{8 - (-4)}{-1 - 5}$$

$$m = \frac{12}{-6} = -2$$

$$-4 = -2(5) + b$$

$$-4 = -10 + b$$

$$\frac{+10}{+10} \quad \frac{+10}{+10}$$

$$6 = b$$

$$y = -2x + 6$$

32. Write the equation of the line that passes through the points  $(2, 3)$  &  $(5, 1)$ .

$$m = \frac{1 - 3}{5 - 2}$$

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

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

$$3 = -\frac{4}{3} + b$$

$$\frac{+\frac{4}{3}}{+\frac{4}{3}} \quad \frac{+\frac{4}{3}}{+\frac{4}{3}}$$

$$4\frac{1}{3} = b$$

$$y = -\frac{2}{3}x + \frac{13}{3}$$

33. Write the equation of the line that is parallel to the equation  $y = 3x + 10$  that passes through the point  $(-9, 4)$ .

$m = 3$  PARALLEL SLOPE = 3

$$4 = 3(-9) + b$$

$$4 = -27 + b$$

$$31 = b$$

$$y = 3x + 31$$

34. Write the equation of the line that is perpendicular to the equation  $y = \frac{3}{5}x + 8$  that passes through the point  $(15, -6)$ .

$m = \frac{3}{5} \quad m_{\perp} = -\frac{5}{3}$

$$-6 = -\frac{5}{3}(15) + b$$

$$-6 = -25 + b$$

$$19 = b$$

$$y = -\frac{5}{3}x + 19$$

35. Write the equation of the line that is parallel to the equation  $3x - 4y = 24$  that passes through the point  $(-12, 8)$

$$8 = \frac{3}{4}(-12) + b$$

$$8 = -9 + b$$

$$17 = b$$

$$y = \frac{3}{4}x + 17$$

$$\frac{-4y}{-4} = \frac{-3x + 24}{-4}$$

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