

## Writing Equations of Parallel and Perpendicular Lines

Period \_\_\_\_\_

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**Write the slope-intercept form of the equation of the line described.**1) through:  $(2, 2)$ , parallel to  $y = x + 4$ 2) through:  $(4, 3)$ , parallel to  $x = 0$ 3) through:  $(2, -4)$ , parallel to  $y = 3x + 2$ 4) through:  $(2, -1)$ , parallel to  $y = -\frac{2}{5}x + 3$ 5) through:  $(1, -5)$ , perp. to  $y = \frac{1}{8}x + 2$ 6) through:  $(4, -1)$ , perp. to  $y = x + 2$

7) through:  $(-5, 5)$ , perp. to  $y = \frac{5}{9}x - 4$

8) through:  $(3, 4)$ , perp. to  $y = -2x - 4$

**Write the standard form of the equation of the line described.**

9) through:  $(4, 4)$ , parallel to  $y = -6x + 5$

10) through:  $(-5, 5)$ , parallel to  $y = -3x + 3$

11) through:  $(3, -2)$ , perp. to  $y = 5x + 4$

12) through:  $(3, 1)$ , perp. to  $y = -\frac{2}{3}x + 4$

**Write the standard form of the equation of each line.**

13)  $y = 3x + 1$

14)  $y = -\frac{9}{5}x + 3$

15) Slope = 1, y-intercept = 0

16) Slope =  $-\frac{7}{2}$ , y-intercept = 2

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

18)  $y - 4 = -\frac{6}{5}(x + 5)$

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

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

20)  $y + 3 = \frac{1}{2}(x + 2)$

Algebra IA

Unit 4 Worksheet 8

Interpreting slope and y-intercept – Part 2

Name Shaina Knobel

1. The function below shows the cost of a hamburger with different numbers of toppings (t).

function notation

$$f(t) = 1.90 + 1.40t$$

function of t

- What is the y-intercept, and what does it mean?
- What is the slope, and what does it mean?
- If Jodi paid \$3.30 for a hamburger, how many toppings were on Jodi's hamburger?

2. The function below shows the cost of an ice cream sundae with different numbers of toppings (t).

$$f(t) = 2.25 + 0.75t$$

- What is the y-intercept, and what does it mean?
- What is the slope, and what does it mean?
- If Kaye paid \$6.00 for a sundae, how many toppings were on Kaye's sundae?

$$\begin{array}{r} 6.00 = 2.25 + .75C \\ - 2.25 \quad - 2.25 \\ \hline 3.75 = .75C \\ \hline C = 5 \end{array}$$

$$C = 5$$

3. The function below shows the cost to attend the fair if you ride  $r$  rides.

$$f(r) = 5 + 1.75r$$

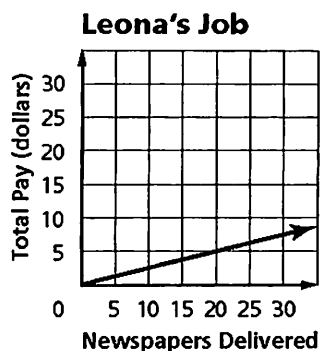
- a. What is the y-intercept, and what does it mean?
- b. What is the slope, and what does it mean?
- c. If Al spent \$19.00 at the fair, how many rides did Al ride?

4. The function below shows the cost for Mrs. Franklin to go to a buffet with  $c$  of her grandchildren.

$$f(c) = 6.85 + 2.95c$$

- a. What is the y-intercept, and what does it mean?
- b. What is the slope, and what does it mean?
- c. If Mrs. Franklin paid 18.65 for the buffet, how many of her grandchildren did she take to the buffet?

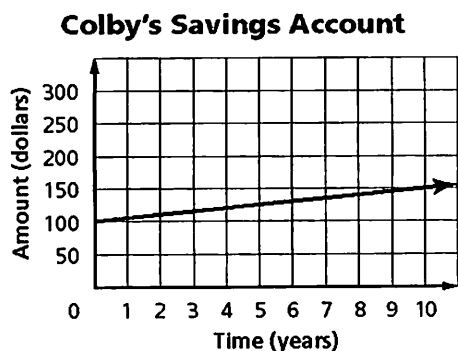
5. The graph below shows the number of newspapers delivered and total pay for Leona's newspaper delivery job. What does the slope of this graph represent?



6. Dionne pays a fixed fee plus an hourly rate to rent a boat. The table below shows how much Dionne paid for the boat. What was Dionne's hourly rate to rent the boat?

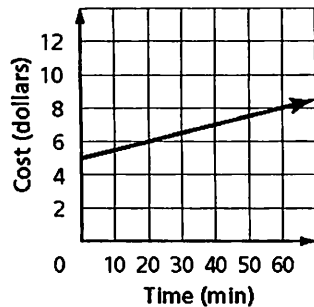
| Dionne's Boat Rental |      |      |      |      |      |
|----------------------|------|------|------|------|------|
| Hours Rented         | 1    | 2    | 3    | 4    | 5    |
| Amount Paid          | \$27 | \$39 | \$51 | \$63 | \$75 |

7. Colby put \$100 in a savings account. The graph below shows how the amount in the account would increase over the next ten years. What does the y-intercept represent?



8. Tara pays a base rate for her long distance phone service plus a per-minute charge. The graph below shows what she would pay for her long distance phone service for the first 60 minutes. What does the y-intercept of this graph represent?

**Long Distance Service**



9. Rich is a member of a gym. He pays a monthly fee plus a per-visit fee. The equation below represents the monthly amount Rich pays for his membership to the gym per month for  $x$  visits.

$$y = 3x + 10$$

What does the y-intercept of the graph of this equation represent?

10. Nan works as a commissioned sale rep. She makes a weekly base salary plus a commission for each sale she makes. The table below shows how much Nan can make. What is Nan's weekly base salary?

| Nan's Weekly Salary |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|
| Sales Made          | 1     | 2     | 3     | 4     | 5     |
| Salary              | \$250 | \$300 | \$350 | \$400 | \$450 |

11. Charlie rented a moving truck. He paid a daily fee plus a per-mile fee to rent the truck. The equation below represents the daily amount Charlie paid for the truck if he drives it  $x$  miles.

$$y = 0.5x + 10$$

What does the slope of the graph of this equation represent?

Write a linear equation in slope-intercept form to model each situation.

12. You rent a bicycle for \$20 plus \$2 per hour.

13. An auto repair shop charges \$50 plus \$25 per hour.

14. A candle is 6 inches tall and burns at a rate of  $\frac{1}{2}$  inch per hour.

15. The temperature is  $15^{\circ}$  and is expected to fall  $2^{\circ}$  each hour during the night.

16. What happens to the equation when  $y = x$  becomes  $y = x + 3$ ?
17. What happens to the equation when  $y = x$  becomes  $y = x - 2$ ?
18. What happens to the equation when  $y = x$  becomes  $y = -x$ ?
19. What happens to the equation when  $y = x$  becomes  $y = 4x$ ?
20. What happens to the equation when  $y = x$  becomes  $y = 3x - 7$ ?
21. What happens to the equation when  $y = x$  becomes  $y = -4x + 5$ ?
22. What happens to the equation when  $y = 7$  becomes  $y = 3$ ?
23. What happens to the equation when  $y = -3$  becomes  $y = 2$ ?

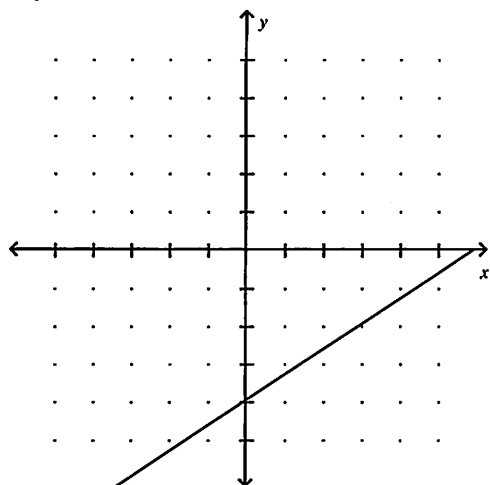
Write an equation in slope-intercept form, given the following information.

24. The slope is 5 and the y-intercept is 8.

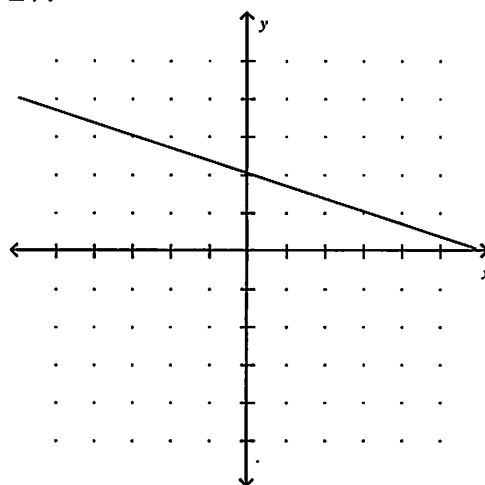
25. The slope is -3 and the y-intercept is -2.

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

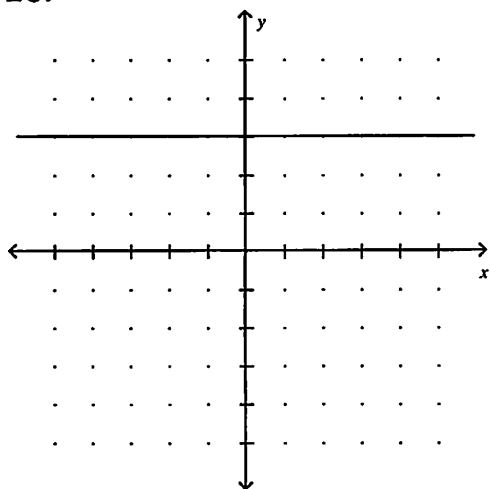
26.



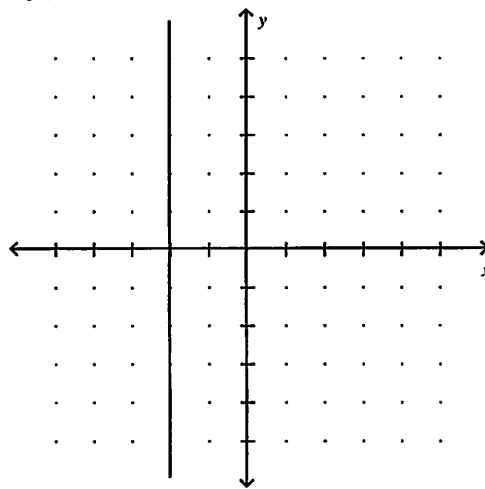
27.



28.

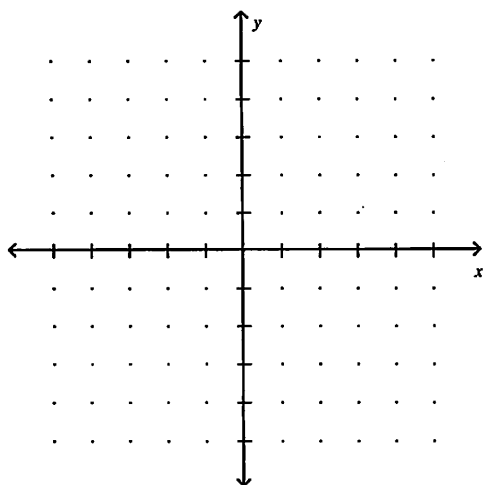


29.

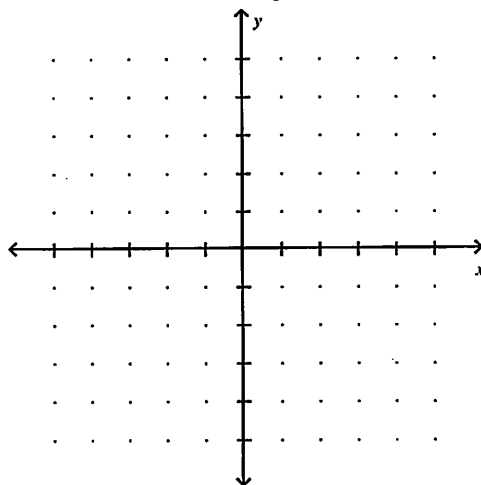


Graph the line that passes through the given point and has the given slope.

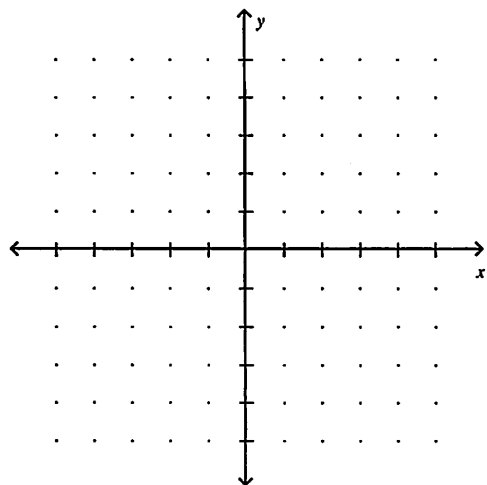
30.  $(3, 1)$   $m = 2$



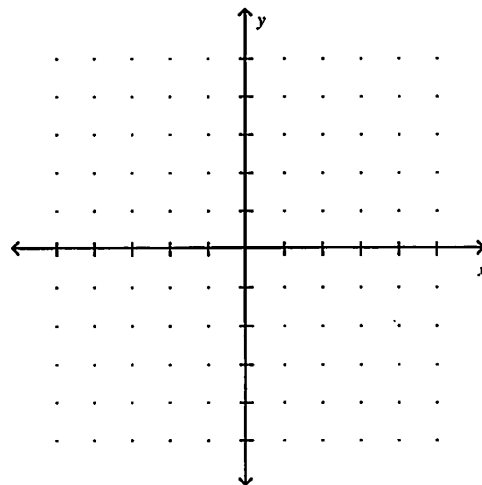
31.  $(-2, 5)$   $m = \frac{-1}{3}$



32.  $(4, -2)$   $m = 0$



33.  $(3, -2)$   $m = \text{undefined}$



# Graphing & Writing Equations of Lines

Name \_\_\_\_\_

Spina B. Knobel

Algebra I  
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## 5) Finding slope using the slope formula

Write the SLOPE FORMULA HERE:

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

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

1)  $(-7, -1), (12, -19)$

$$m = \frac{-19 - (-1)}{12 - (-7)} = \frac{-20}{19} \quad m = -\frac{20}{19}$$

3)  $(-1, -6), (-1, 5)$

$$m = \frac{5 - (-6)}{-1 - (-1)} = \frac{11}{0} \quad m = \text{undefined}$$

5)  $(-11, -4), (-10, -4)$

$$m = \frac{-4 - (-4)}{-10 - (-11)} = \frac{0}{1} = 0 \quad m = 0$$

2)  $(-11, -9), (-12, -4)$

$$m = \frac{-4 - (-9)}{-12 - (-11)} = \frac{5}{-1} = -5 \quad m = -5$$

4)  $(20, -11), (14, -10)$

$$m = \frac{-10 - (-11)}{14 - 20} = \frac{1}{-6} = -\frac{1}{6} \quad m = -\frac{1}{6}$$

6)  $(-17, 7), (-1, 6)$

$$m = \frac{6 - 7}{-1 - (-17)} = \frac{-1}{16} = -\frac{1}{16} \quad m = -\frac{1}{16}$$

## TAKE SKILLS CHECK #1

Write the slope and the y-intercept of the graph for each equation.

slope y-intercept

$y = 5x + 2$  \_\_\_\_\_

$y = 2x - 7$  \_\_\_\_\_

$y = \frac{1}{3}x + 6$  \_\_\_\_\_

$y = 3x - 1$  \_\_\_\_\_

$y = \frac{3}{2}x + 9$  \_\_\_\_\_

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

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

$y = -2x + 6$  \_\_\_\_\_

$y = -9x + 1$  \_\_\_\_\_

$y = \frac{3}{4}x - 5$  \_\_\_\_\_

$y = x + 1$  \_\_\_\_\_

$y = -x + 2$  \_\_\_\_\_

$y = x + 6$  \_\_\_\_\_

$y = -x - 10$  \_\_\_\_\_

$y = 2x$  \_\_\_\_\_

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

$y = -3x$  \_\_\_\_\_

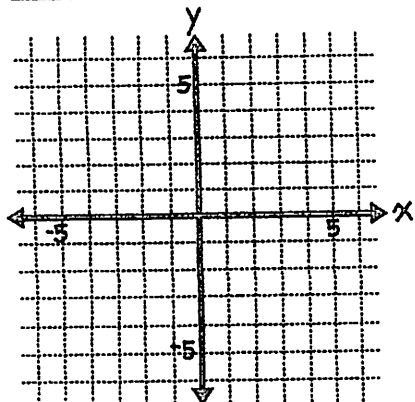
$y = \frac{5}{3}x$  \_\_\_\_\_

# **TS** Graph a Line Given Equation in Slope Intercept Form

Write the slope and y-intercept. Then plot the y-intercept and finish the graph by drawing a line through that point with the proper slope.

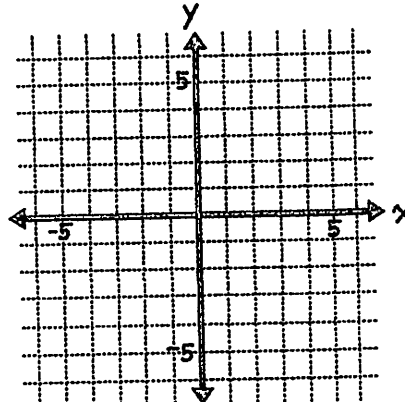
$$y = 2x - 5$$

slope: \_\_\_\_\_ y-intercept: \_\_\_\_\_



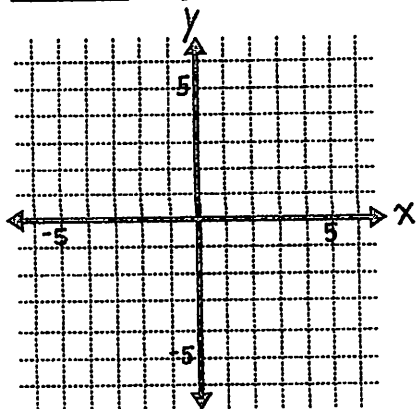
$$y = \frac{1}{3}x + 2$$

slope: \_\_\_\_\_ y-intercept: \_\_\_\_\_



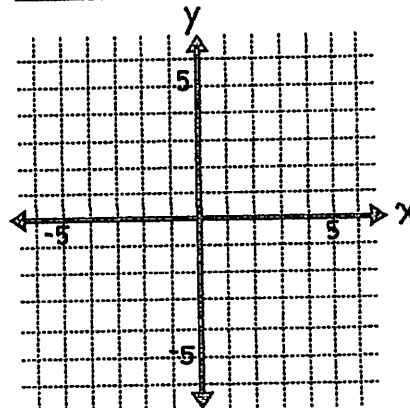
$$y = -\frac{2}{5}x + 1$$

slope: \_\_\_\_\_ y-intercept: \_\_\_\_\_



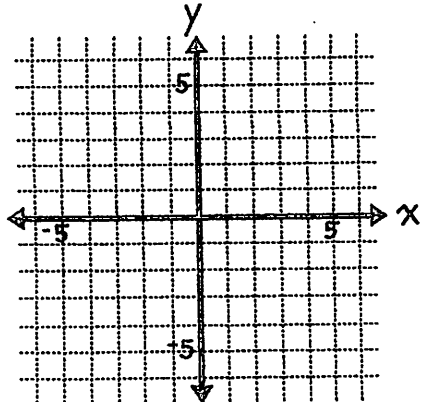
$$y = \frac{3}{4}x$$

slope: \_\_\_\_\_ y-intercept: \_\_\_\_\_



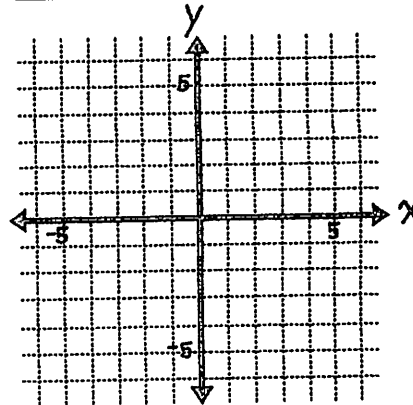
$$y = x - 3$$

slope: \_\_\_\_\_ y-intercept: \_\_\_\_\_

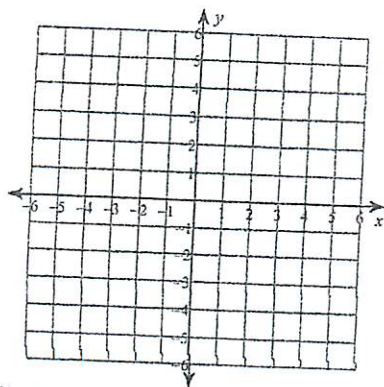


$$y = -x + 4$$

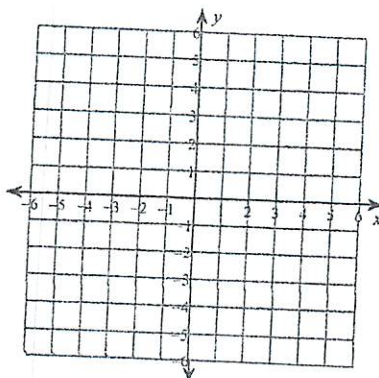
slope: \_\_\_\_\_ y-intercept: \_\_\_\_\_



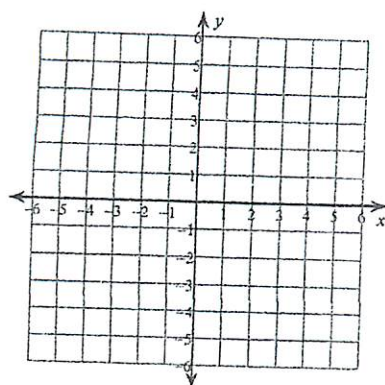
1)  $y = 5$



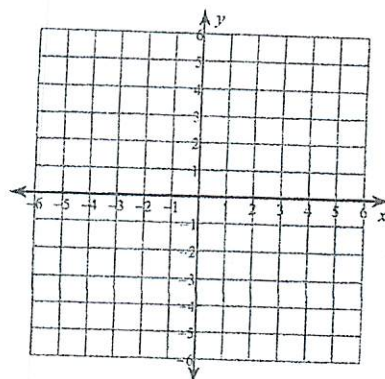
2)  $x = -3$



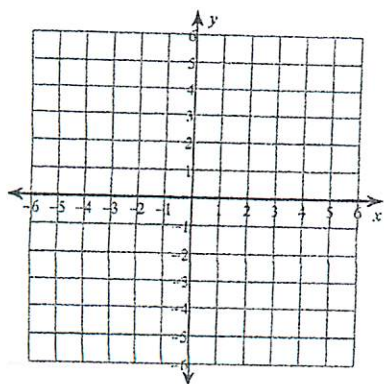
3)  $x = 1$



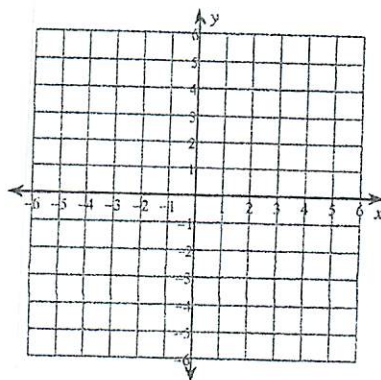
4)  $x = 0$



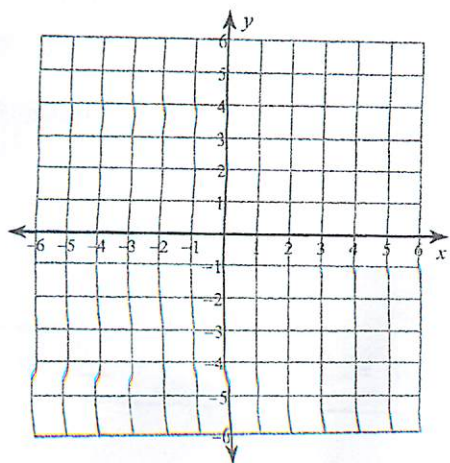
5)  $y = \frac{2}{3}x$



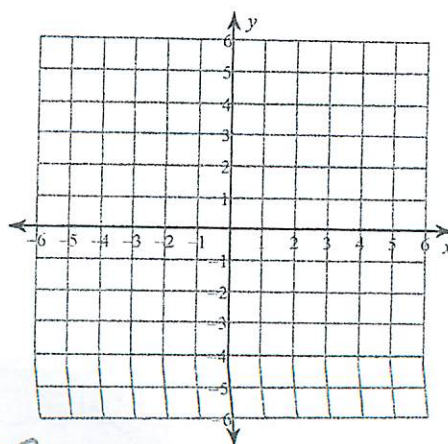
6)  $y = x$



7)  $y = -1$



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



# TS Writing Equation in Slope Intercept form

## Writing Linear Equations in the Form $y = mx + b$

If we want to use the slope and  $y$ -intercept to graph an equation like  $4x + 3y = 6$ , we first have to **solve the equation for  $y$** . That means to find an equivalent equation in the form  $y = mx + b$ , where  $m$  is the slope and  $b$  is the  $y$ -intercept. To do that we use the Addition and Division Principles to get the  $y$ -term by itself on one side of the equation.

$$4x + 3y = 6$$

$$3y = -4x + 6$$

Now we can see that the slope is \_\_\_\_\_ and the  $y$ -intercept is \_\_\_\_\_

Solve each equation for  $y$ . Write the slope ( $m$ ) and  $y$ -intercept ( $b$ ) of the graph.

$$5x + 2y = 12$$

$$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$$6x + 2y = 10$$

$$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$$4y - 3x = 20$$

$$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$$x + y = 8$$

$$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$$x - 2y = 6$$

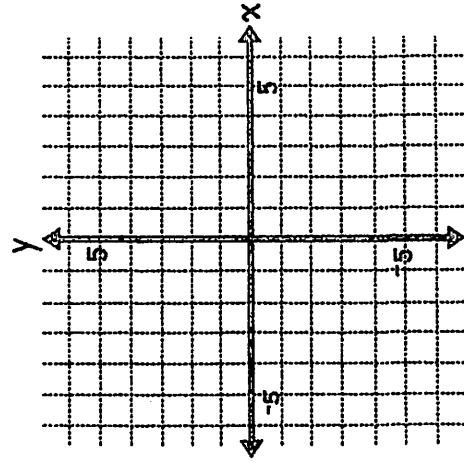
$$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$$x + 3y = 15$$

$$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

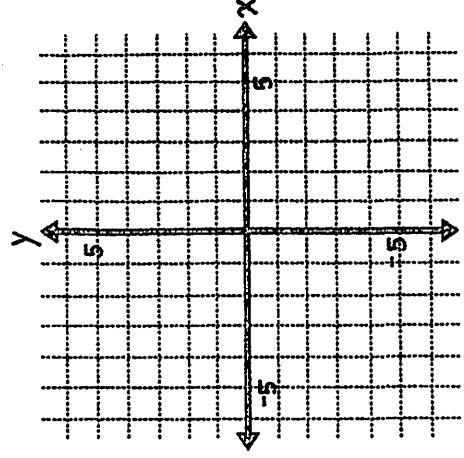
➡ TAKE SKILLS CHECK #3

Solve each equation for  $y$ . Write the slope and  $y$ -intercept. Then use these to graph the equation.



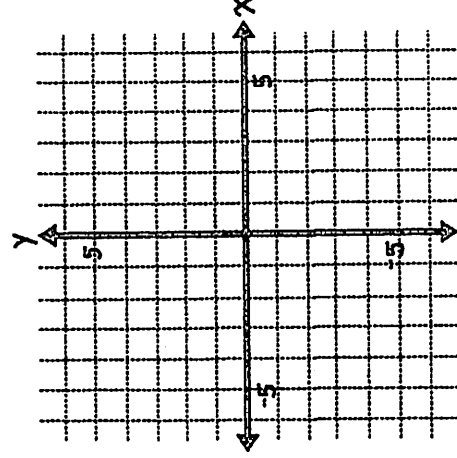
$$2x + 3y = 12$$

$m =$  \_\_\_\_\_  $b =$  \_\_\_\_\_



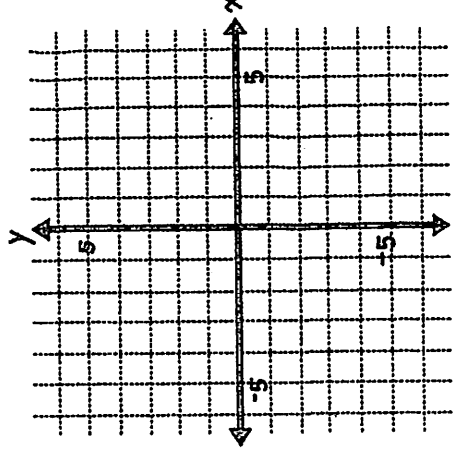
$$5x - 2y = 8$$

$m =$  \_\_\_\_\_  $b =$  \_\_\_\_\_



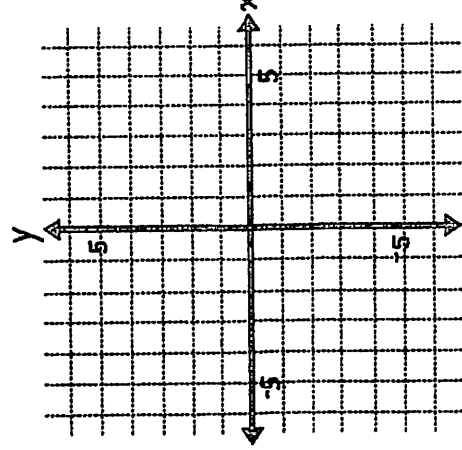
$$x + y = 3$$

$m =$  \_\_\_\_\_  $b =$  \_\_\_\_\_



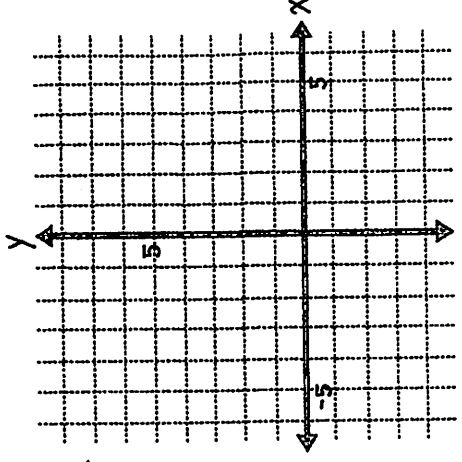
$$3x - y = 2$$

$m =$  \_\_\_\_\_  $b =$  \_\_\_\_\_



$$5x - 10y = 0$$

$m =$  \_\_\_\_\_  $b =$  \_\_\_\_\_



$$x - 4y = -24$$

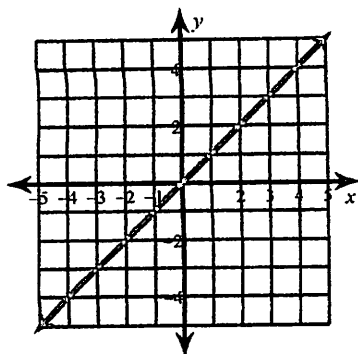
$m =$  \_\_\_\_\_  $b =$  \_\_\_\_\_

# Finding the Equation of a Line from a Graph

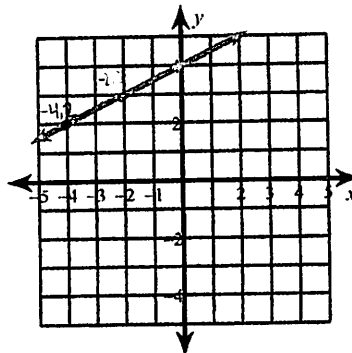
Write the equation of the line given in the graph.

Leave your answer in slope-intercept form,  $y = mx + b$

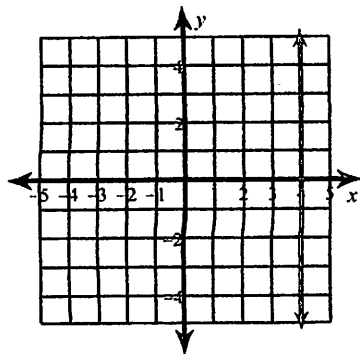
1)



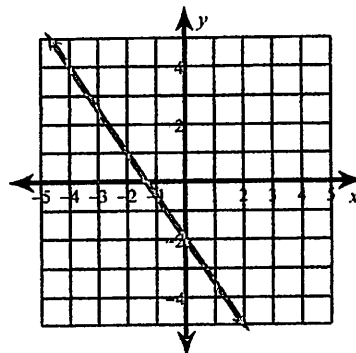
2)



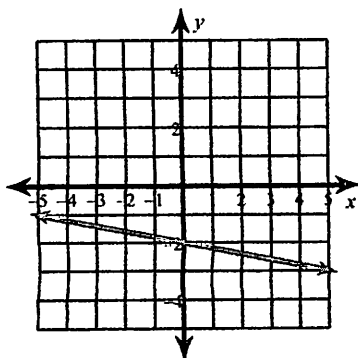
3)



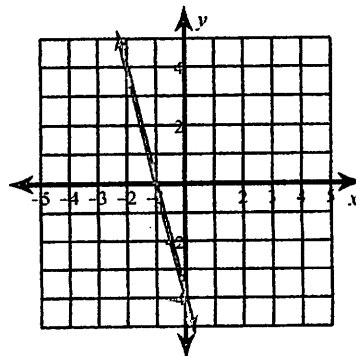
4)



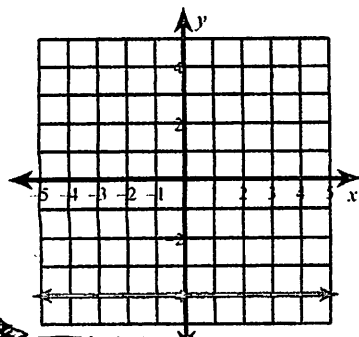
5)



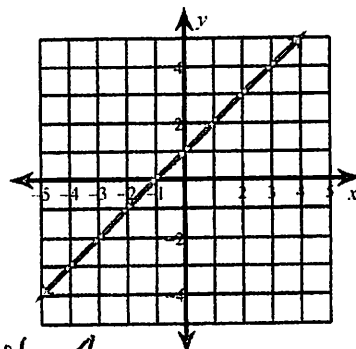
6)



7)



8)



# Review: Graphing and Writing Linear Equations

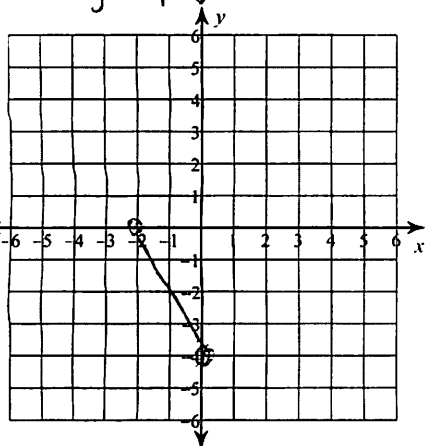
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Date

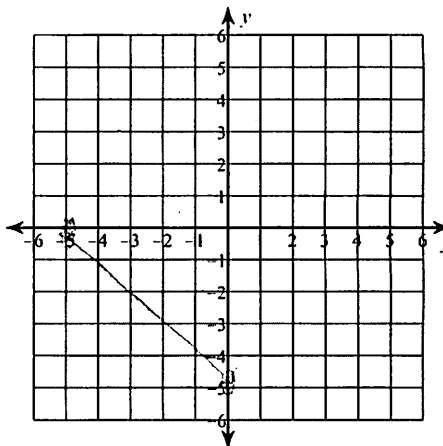
Period

Sketch the graph of each line.

1)  $x$ -intercept =  $-2$ ,  $y$ -intercept =  $-4$



2)  $x$ -intercept =  $-5$ ,  $y$ -intercept =  $-5$



$$y = mx + b$$

↓

↓

slope

$y$  intercept

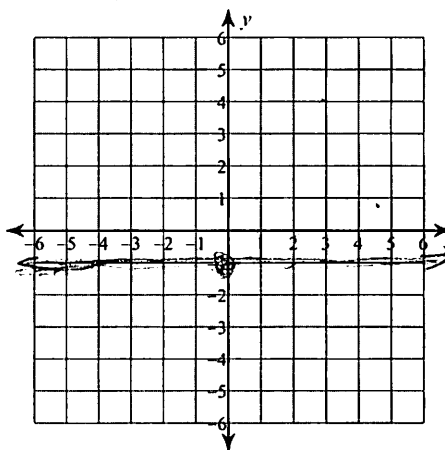
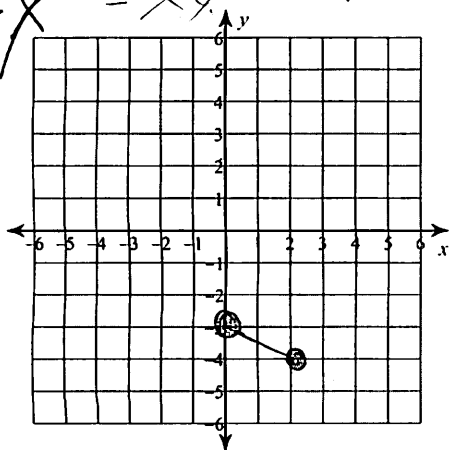
3)  $x + 2y = -6$

4)  $y = -1$

$(x, y)$   $(2, -1)$

$(x, -1)$

$x = 2$



$$\frac{2y}{2} = \frac{-x - 6}{2}$$

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

$-3$

$y$  intercept

$\frac{-1}{2}$

slope

vertical

horizontal

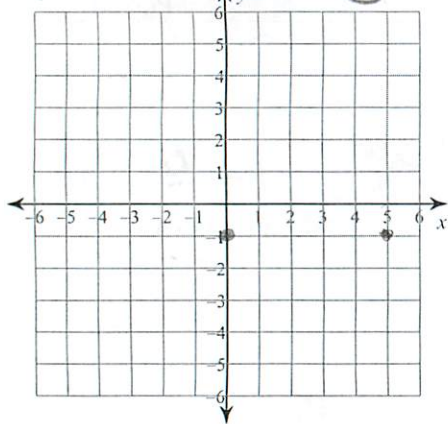
$m = \text{slope} = \frac{\text{rise}}{\text{run}}$

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

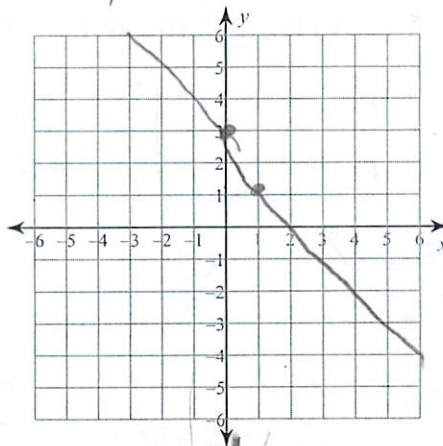
If you wanted to get more points plug in  $x$  for  $x$  solve for  $y$  and then they become your coordinates

$$y = mx + b$$

$$5) \quad y = 5x + 1$$



$$6) \quad y = -2x + 3$$

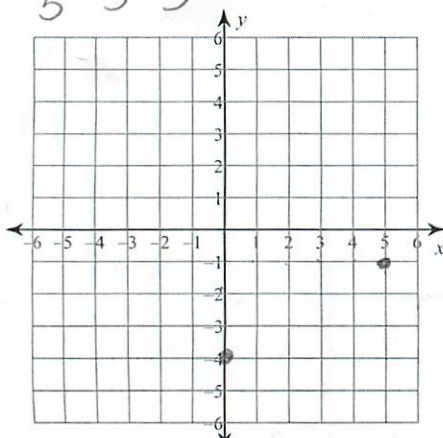


$$y = mx + b$$

$$(0, 3)$$

$$(1, 1)$$

$$7) \quad \frac{5y}{5} = \frac{3x}{5} - \frac{20}{5}$$

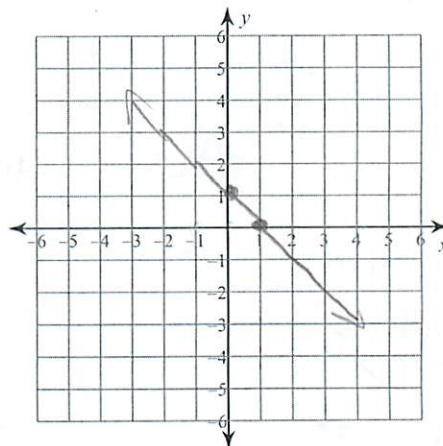


$$y = \frac{3x}{5} - 4$$

$$(0, -4)$$

$$(5, -1)$$

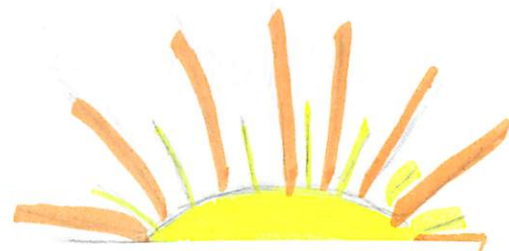
$$8) \quad -x = -1$$



$$-x + 1$$

$$(0, 1)$$

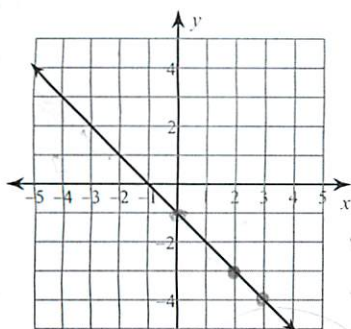
$$(1, 0)$$



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

$y = mx + b$  ①  $m = \text{slope}$   
②  $B = y\text{-Intercept}$

9)

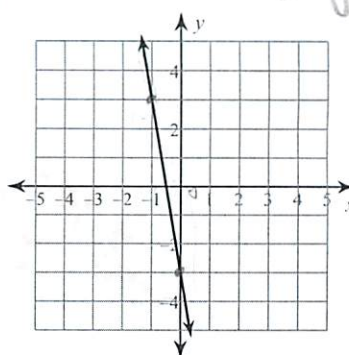


$\frac{y_2 - y_1}{x_2 - x_1}$  slope formula

$y = m(x - x_1) + y_1$   
 $y = -1(x - 2) + 3$   
 $y = -x + 2 + 3$   
 $y = -x + 5$   
 $\frac{-1}{1} \text{ slope} = -1$

① (2, 3)  
② (0, -1)  
 $\frac{-1 - 3}{0 - 2}$   
 $\frac{-4}{-2} = 2$

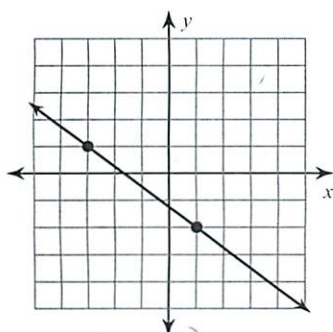
10)



$\frac{y_2 - y_1}{x_2 - x_1}$   
 $\frac{-3 - 5}{0 - (-1)} = \frac{-8}{1} = -8$   
 $y = mx + b$   
 $y = -8x - 3$

Find the slope of each line.

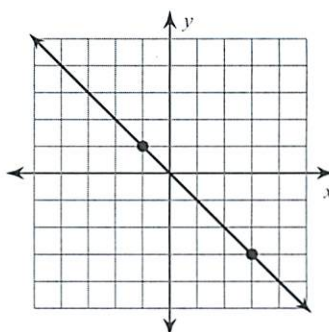
11)



$(-3, 1) (1, -2)$

$\frac{-2 - 1}{1 - (-3)} = \frac{-3}{4}$  slope

12)



$(-1, 1) (3, -3)$

$\frac{-3 - 1}{3 - (-1)} = \frac{-4}{4} = -1 = \text{slope}$

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

13) (14, 20), (19, 4)

$m = \frac{19 - 14}{4 - 20} = \frac{5}{-16}$   $m = -.3125$

14) (-14, 0), (-13, -20)

$m = \frac{-13 - (-14)}{-20 - 0} = \frac{-1}{-20} = \frac{1}{20}$   
 $m = 1.35$

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

15)  $x + 8 = \frac{-2y}{-2}$

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

16)  $\frac{-9}{-3} = \frac{-x}{-3} - \frac{3y}{-3}$

$$x + 3 = y$$

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

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

18)  $y = \frac{2}{3}(x - 3)$

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

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

19) Slope =  $-\frac{5}{3}$ , y-intercept = 4

$$y = -\frac{5}{3}x + 4$$

20) Slope = 5, y-intercept = 5

$$y = 5x + 5$$

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

21) through:  $(-1, 3)$ , slope =  $-2$

22) through:  $(2, -5)$ , slope =  $-3$

Write the slope-intercept form of the equation of the line through the given points.

23) through:  $(-4, 3)$  and  $(-2, 3)$

24) through:  $(5, 3)$  and  $(-5, -4)$