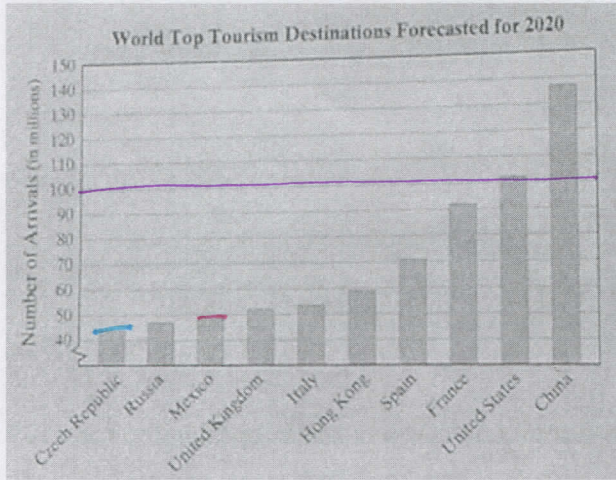


Bridge to Algebra 2

Quiz Review 3.1 – 3.4

3.1 Reading Graphs & the Rectangular Coordinate System



1 – 3: The following bar graph shows the top 10 tourist destinations and the number of tourists that visit each destination per year forecasted for 2020. Use the graph to the left to answer questions 1 – 3.

1) Which location shown is predicted to be the least popular tourist destination?

Czech Republic

2) Which locations shown are predicted to have more than 100 million tourists per year?

The U.S. & China.

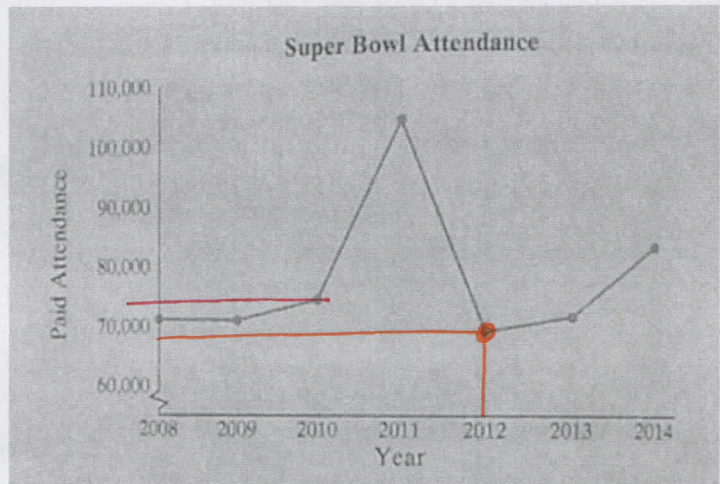
3) Estimate the predicted number of tourists per year whose destination is Mexico.

Almost 50 million

4 – 5: The following line graph shows the paid attendance at each Super Bowl game from 2008 through 2014. Use this graph to answer the next two questions.

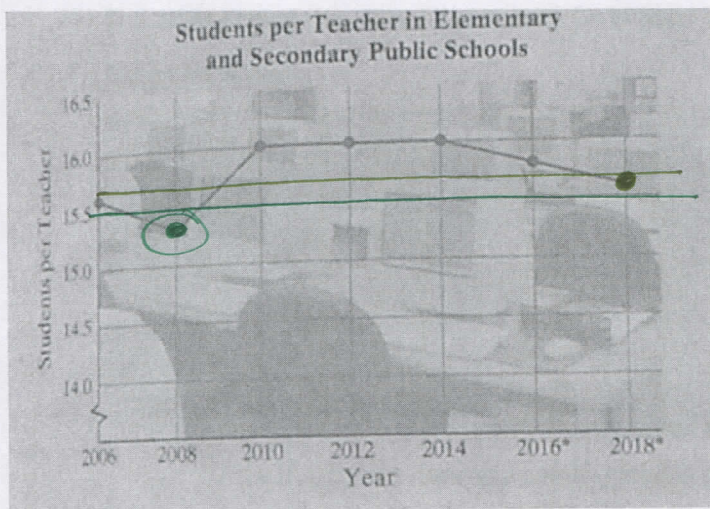
4) Estimate the Super Bowl attendance 2010.

74,000



5) Find the year on the graph with the least Super Bowl attendance and approximate that attendance.

2012



6 – 7: The line graph below shows the number of students per teacher in U.S. public elementary and secondary schools. Use this graph for questions 6 and 7.

6) Approximate the number of students per teacher predicted in 2018.

15.7

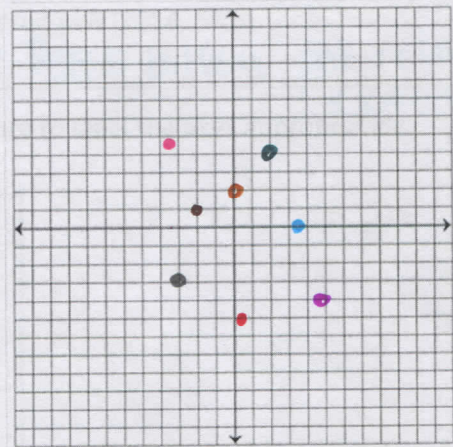
7) What was the first year shown that the number of students per teacher fell below 15.5?

2008

II | I  
III | IV

Plot each ordered pair. State in which quadrant or on which axis each point lies.

- 8) (2, 4) I  
 9) (0, 2) Y  
 10) (-2, 1) II  
 11) (-3, -3) III  
 12)  $(3\frac{3}{4}, 0)$   $\frac{15}{4}$  X  
 13) (5, -4) IV  
 14) (-3.4, 4.8) II  
 15)  $(\frac{1}{3}, -5)$  IV

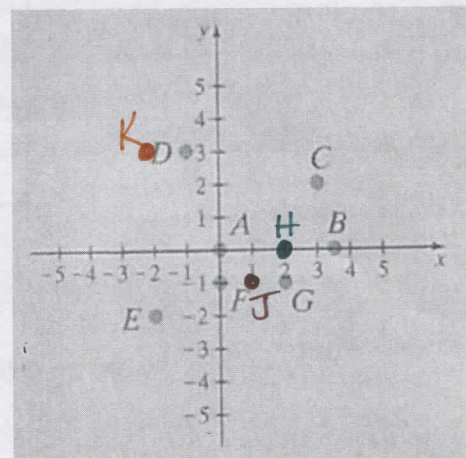


Find the x- and y- coordinates of each labeled point.

- 16) B (3.5, 0)  
 17) D (-1, 3)  
 18) F (0, -1)


Plot the following points on the graph to the right.

- 19) H (2, 0)  
 20) K (-2, 3)  
 21) J (1, -1)



Solve. Give answers in terms of the problem.

- 22) The table shows the amount of money (in billions of dollars) Americans spent on their pets for the years shown.



Year	Pet-Related Expenditures (in billions of dollars)
2011	51.0
2012	53.3
2013	55.7
2014	58.5

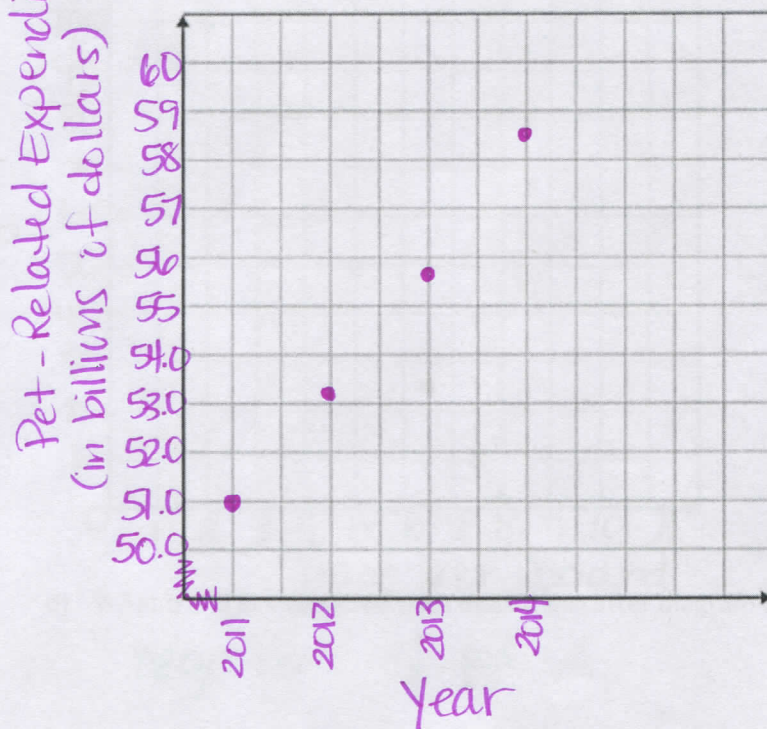
- a. Write this paired data as a set of ordered pairs of the form (year, pet-related expenditures).

$(2011, 51.0)$ ;  $(2012, 53.3)$ ;  $(2013, 55.7)$ ;  $(2014, 58.5)$

- b. In your own words, write the meaning of the ordered pair (2014, 58.5).

In the year 2014, there were \$58.5 billion pet-related expenditures.

- c. Create a scatter diagram of the paired data. Be sure to label the axes appropriately.



- d. What trend in the paired data does the scatter diagram show?

positive trend

23) A local lumberyard, Eastman Cartwright, uses quantity pricing. The table shows the price per board for different amounts of lumber purchased.

Price per Board (in dollars)	Number of Boards Purchased
8.00	1
7.50	10
6.50	25
5.00	50
2.00	100

a) Write the data as ordered pairs of the form (price per board, number of boards purchased).

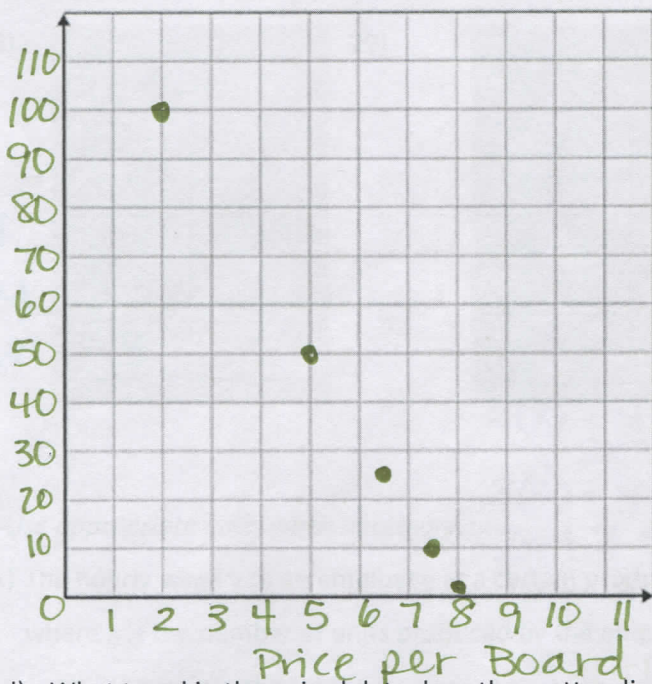
$(8, 1); (7.5, 10); (6.5, 25); (5, 50); (2, 100)$

b) In your own words, write the meaning of the ordered pair (2.00, 100).

If you purchase 100 boards, then they cost \$2 each.

c) Create a scatter diagram of the paired data. Be sure to label the axes appropriately.

Number of Boards Purchased



d) What trend in the paired data does the scatter diagram show?

negative slope

Determine whether each ordered pair is a solution of the given linear equation.

24)  $3x + y = 8$ ; (2, 3), (0, 8), (8, 0)

$\times 3(2) + 3 = 8$   
 $6 + 3 = 8$

$\checkmark 3(0) + 8 = 8$   
 $8 = 8$

$\times 3(8) + 0 = 8$   
 $24 + 0 = 8$

25)  $y = -\frac{1}{2}x$ ; (0, 0), (4, 2)

$\checkmark 0 = -\frac{1}{2}(0)$   
 $0 = 0$

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

Complete each ordered pair so that it is a solution of the given linear equation.

26)  $x - 5y = -1$ ; (-11, -2), (4, 1)

$\times -5(-2) = -1$

$\times +10 = -1$

$\times = -11$

$4 - 5y = -1$   
 $-5y = -5$   
 $-5$   
 $y = 1$

27)  $y = \frac{1}{5}x - 2$ ; (-10, -4), (15, 1)

$y = \frac{1}{5}(-10) - 2$

$y = -2 - 2$

$y = -4$

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

$3 = \frac{1}{5}x$

$15 = x$

Complete the table of ordered pairs for each linear equation.

28)

$y = \frac{1}{3}x$	
x	y
0	0
-6	-2
3	1

$\frac{1}{3}(0) = y$   
 $\frac{1}{3}(-6) = y$   
 $3 \cdot 1 = \frac{1}{3}x \cdot 3$

29)

$2x + y = 4$	
x	y
0	4
2	0
1	2

$2(x) + 4 = 4$   
 $2x = 0$   
 $2(2) + y = 4$   
 $2x + 2 = 4$

30)

$x - 6y = 3$	
x	y
0	$-\frac{1}{2}$
1	$-\frac{1}{3}$
-3	-1

$x - 6(-1) = 3$   
 $x + 6 = 3$   
 $x = -3$   
 $0 - 6y = 3$   
 $y = -\frac{1}{2}$   
 $1 - 6y = 3$   
 $-6y = 2$

Solve. Use appropriate units when necessary.

31) The hourly wage  $y$  of an employee at a certain production company is given by  $y = 0.25x + 9$

where  $x$  is the number of units produced by the employee in an hour.

a. Complete the table.

# of units	x	0	1	5	10
wage	y	9	9.25	10.25	11.50

$y = 0.25(0) + 9 = 0 + 9$   
 $y = 0.25(1) + 9 = 9.25$   
 $y = 0.25(5) + 9 = 10.25$   
 $y = 0.25(10) + 9 = 11.50$

b. Find the number of units that an employee must produce each hour to earn an hourly wage of \$12.25.

$x = ?$  when  $y = 12.25$   
 $12.25 = 0.25x + 9$   
 $3.25 = 0.25x$   
 $13 = x$

13 units

### 3.2 Graphing Linear Equations

Determine whether each equation is a **linear** equation in two variables.

32)  $y = x - 15$  *linear*

33)  $x = y^3$  *non-linear, cubic*

34)  $0.01x - 0.2y = 8.8$  *linear*

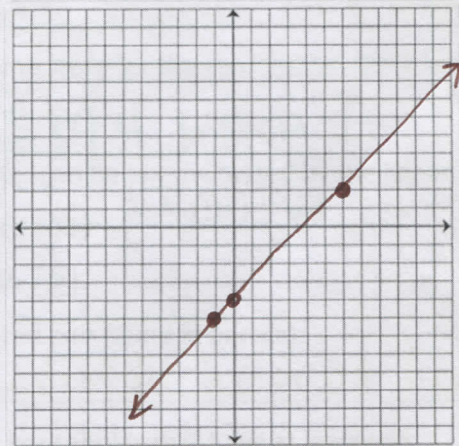
35)  $x = 25$  *linear, not 2 variables*

For each equation, find three ordered pair solutions by completing the table. Then use the ordered pairs to graph the equation.

36)

$x - y = 4$	
$x$	$y$
0	-4
6	2
-1	-5

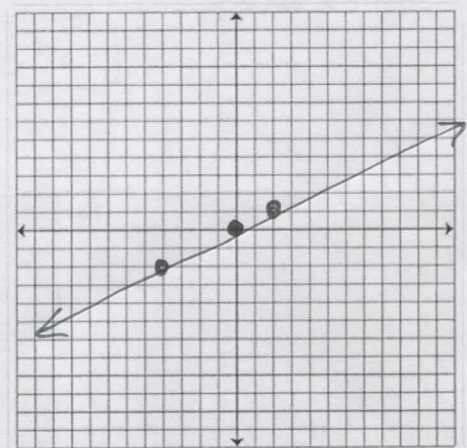
$0 - y = 4 \quad (0, -4)$   
 $x - 2 = 4 \quad (6, 2)$   
 $-1 - y = 4 \quad (-1, -5)$



37)

$y = \frac{1}{2}x$	
$x$	$y$
0	0
-4	-2
2	1

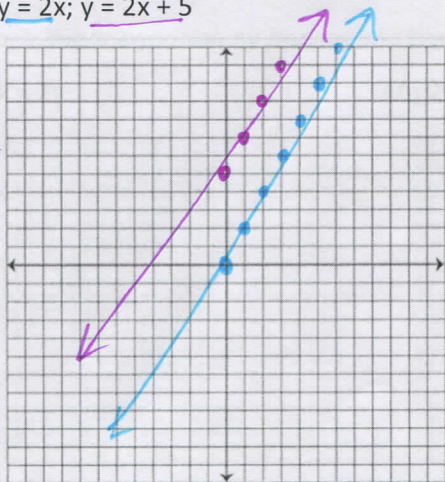
$\frac{1}{2}(0) = 0$   
 $\frac{1}{2}(-4) = -2$   
 $\frac{1}{2}(2) = 1$



Graph each pair of linear equation on the same set of axes. Explain in a complete sentence how the graphs are similar and how they are different.

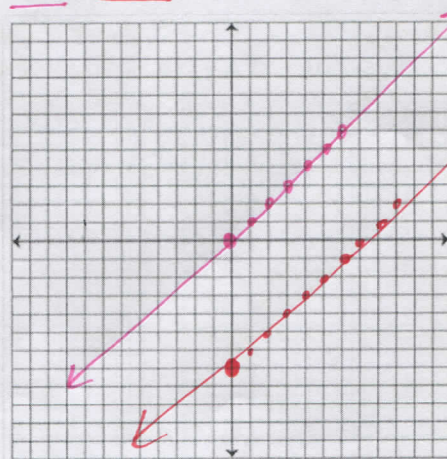
38)  $y = 2x$ ;  $y = 2x + 5$

*// lines. Same slope w/ different y-intercepts*



39)  $y = x$ ;  $y = x - 7$

*// lines Same slope but different y-intercepts*



Solve.

40) The revenue  $y$  (in billions of dollars) for Eastman Cartwright Home store during the years 2019 through 2021 is given by the equation  $y = 3.2x + 65.2$ , where  $x$  is the number of years after 2019.

$3.2(3) + 65.2$

a. Use this equation or a graph of it to complete the ordered pair  $(3, \underline{74.8})$ .

b. Write a sentence explaining the meaning of the answer to part (a).

3 years after 2019, Home will make \$74.8 billion.

c. If this trend continues, predict the revenue for Home store for the year 2025.  $2025 - 2019$   
 $3.2(6) + 65.2 = 84.4$   $x = 6$

\$84.4 billion

41) The percent of U.S. households  $y$  with at least one computer can be approximated by the linear equation  $y = 2.4x + 51$ , where  $x$  is the number of years since 2000.  $2.4(10) + 51$

a. Use the equation to complete the ordered pair  $(10, \underline{75})$ .

b. Write a sentence explain the meaning of the ordered pair found in part (a).

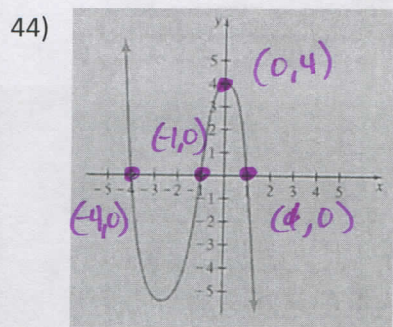
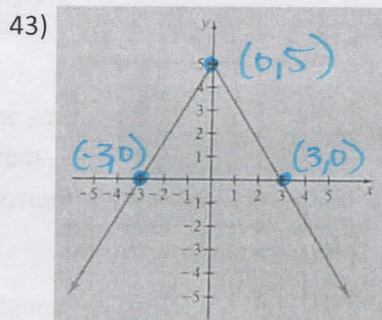
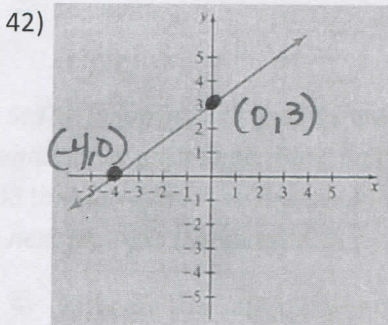
In 2010, 75% of U.S. households have at least one computer.

c. If this trend continues, predict the percent of U.S. households that have at least one computer in 2030.  $2030 - 2000 = 30$   $2.4(30) + 51$   
 $x = 30$   $y = 123$

123%

### 3.3 Intercepts

Identify the intercepts in the proper notation.



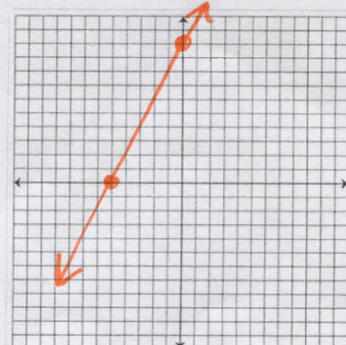
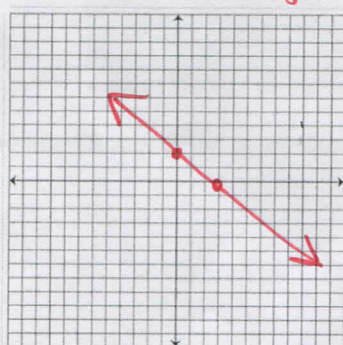
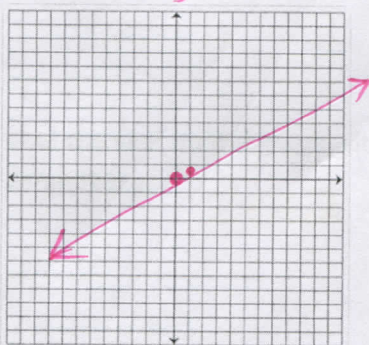
Graph each linear equation by finding and plotting its intercepts.

45)  $x = 2y$   $0 = 2y$   $0 = y$   $(0, 0)$

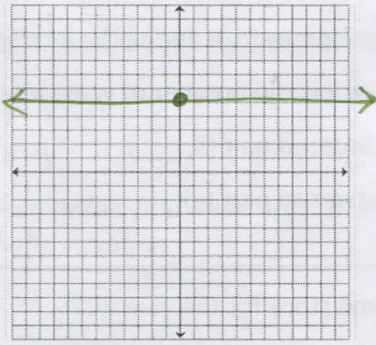
46)  $2x + 3y = 6$   $2x = 6$   $x = 3$   $3y = 6$   $y = 2$

47)  $y = 2x + 10$   $(0, 10)$   $0 = 2x + 10$   $-10 = 2x$   $-5 = x$

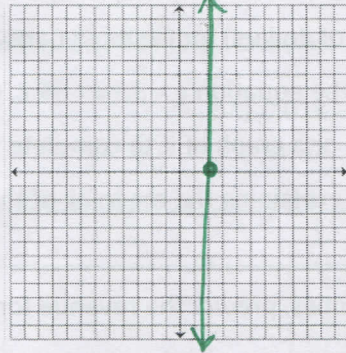
$x$	$y$
$0$	$0$
$1$	$\frac{1}{2}$



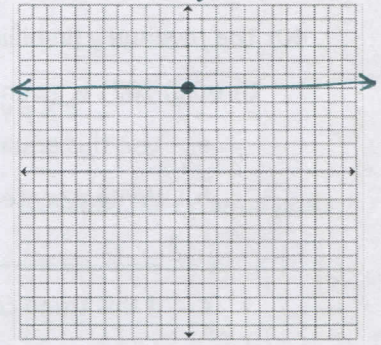
48)  $y = 5$



49)  $x - 2 = 0$   
 $+2 \quad +2$



50)  $y - 6 = 0$   
 $+6 \quad +6$   $y = 6$



True or False. Write the entire word out to earn full credit.

51) The graph of  $y = 4x$  contains the point  $(0, 0)$ .

True

$y = 4x + 0$

52) The graph of  $y = 5x$  contains the point  $(5, 1)$ .

False

$y = 5x$   
 $1 = 5(5)$   
 $1 \neq 25$

**3.4 Slope & Rate of Change**

Find the slope of the line that passes through the given points.

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

53)  $(3, 1)$  &  $(2, 6)$

$m = \frac{6 - 1}{2 - 3} = \frac{5}{-1} = -5$

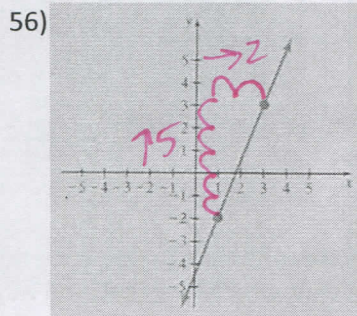
54)  $(6, -6)$  &  $(6, 2)$

$m = \frac{2 - (-6)}{6 - 6} = \frac{8}{0}$   
undefined

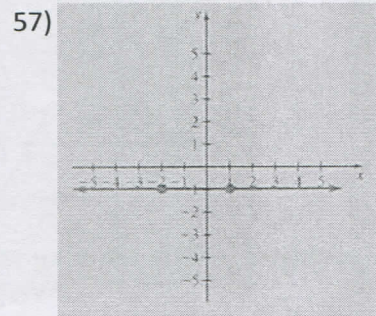
55)  $(0, 13)$  &  $(-4, 13)$

$m = \frac{13 - 13}{0 - (-4)} = \frac{0}{4}$   
 $m = 0$

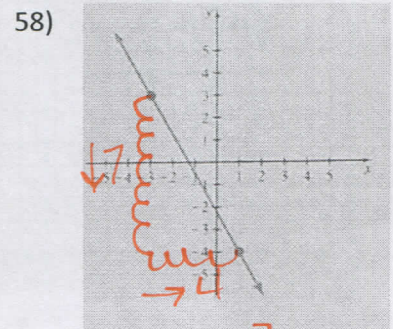
Find the slope of each line if it exists. Then state whether the slope of the line is positive, negative, 0, or is undefined.



$m = \frac{5}{2}$



$m = 0$



$m = -\frac{7}{4}$

Determine whether a line with the given slope is upward, downward, horizontal, or vertical.

59)  $m = -3$

downward ↘

60)  $m$  is undefined

vertical ↕

Find the slope of each line. Show work to earn full credit.

61)  $y = 4$

$y = 0x + 4$

$\longleftrightarrow$   
 $m = 0$

62)  $x = 2$

↕  
undefined

63)  $y = -11$

$y = 0x - 11$

$\longleftrightarrow$   
 $m = 0$

64)  $x = 0$

↕  
undefined



Find the slope of the line that is (a) parallel and (b) perpendicular to the line through each pair of points.

65)  $(6, -2)$  &  $(1, 4)$   $m = \frac{4 - (-2)}{1 - 6} = \frac{6}{-5} = -\frac{6}{5}$

66)  $(6, -1)$  &  $(-4, -10)$   $m = \frac{-10 - (-1)}{-4 - 6} = \frac{-9}{-10} = \frac{9}{10}$

(a)  $m = -\frac{6}{5}$

(a)  $m = \frac{9}{10}$

(b)  $\perp m = \frac{5}{6}$

(b)  $\perp m = -\frac{10}{9}$

Determine whether each pair of lines is parallel, perpendicular, or neither.

67)  $y = \frac{1}{5}x + 20$ ;  $y = -\frac{1}{5}x$

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

neither

68)  $-x + 2y = -2$ ;  $2x = 4y + 3$

$2y = x - 2$     $2x - 3 = 4y$   
 $y = \frac{1}{2}x - 1$     $y = \frac{1}{2}x - \frac{3}{4}$

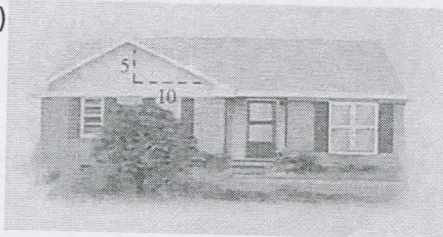
$m = \frac{1}{2}$

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

parallel

The pitch of a roof is its slope. Find the pitch of the roof shown.

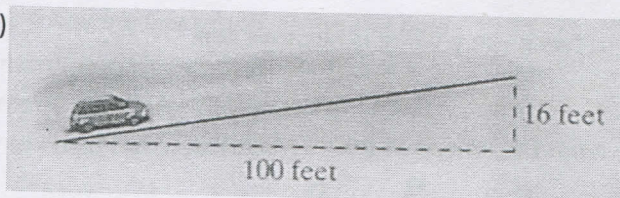
69)



$\uparrow 5$   
 $\rightarrow 10$     $= \frac{5}{10} = \frac{1}{2}$

The grade of a road is its slope written as a percent. Find the grade of the road shown.

70)



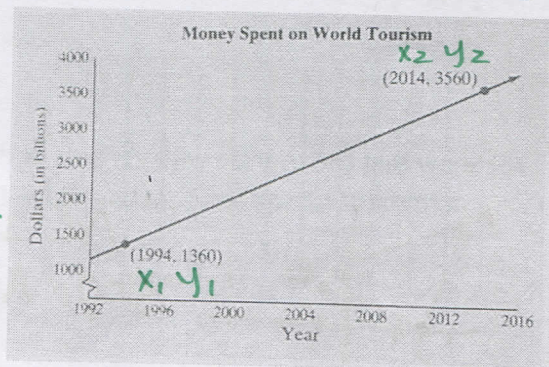
$\uparrow 16$   
 $\rightarrow 100$     $= \frac{16}{100} = 0.16 (100)$   
 16%

Find the slope of the line and write a sentence explaining the meaning of the slope as a rate of change. Don't forget to attach the proper units.

71) This graph approximates the amount of money  $y$  (in billions of dollars) spent worldwide on leisure travel and tourism for year  $x$ .

$m = \frac{\Delta y}{\Delta x} = \frac{3560 - 1360}{2014 - 1994} = \frac{2200}{20}$

$m = 110$



World tourism spends \$110 billion dollars each year.

**SPIRAL REVIEW:**

72) Solve each equation for y.

a.  $x - y = 3$   

$$\begin{array}{r} x - y = 3 \\ -x \quad -x \\ \hline -y = -x + 3 \\ \hline -1 \end{array}$$
 $y = x - 3$

b.  $5x + 2y = 7$   

$$\begin{array}{r} 5x + 2y = 7 \\ -5x \quad -5x \\ \hline 2y = -5x + 7 \\ \hline 2 \end{array}$$
 $y = -\frac{5}{2}x + \frac{7}{2}$

c.  $4y = -8x$   

$$\begin{array}{r} 4y = -8x \\ \hline 4 \quad 4 \end{array}$$
 $y = -2x$

d.  $2x - 9y = -20$   

$$\begin{array}{r} 2x - 9y = -20 \\ -2x \quad -2x \\ \hline -9y = -2x - 20 \\ \hline -9 \end{array}$$

$y = \frac{2}{9}x + \frac{20}{9}$

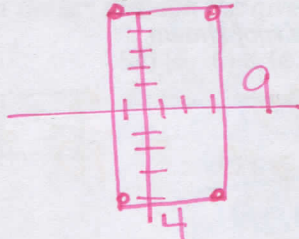
e.  $y - 7 = -9(x - 6)$   

$$\begin{array}{r} y - 7 = -9(x - 6) \\ y - 7 = -9x + 54 \\ \hline y = -9x + 61 \end{array}$$
 $y = -9x + 61$

f.  $y - (-3) = 4(x - (-5))$   

$$\begin{array}{r} y + 3 = 4(x + 5) \\ y + 3 = 4x + 20 \\ \hline y = 4x + 17 \end{array}$$
 $y = 4x + 17$

73) Find the perimeter of the rectangle whose vertices are the points with coordinates: (-1, 5), (3, 5), (3, -4), and (-1, -4).



$$P = 2l + 2w$$
  

$$P = 2(4) + 2(9)$$
  

$$= 8 + 18$$
 $P = 26$

74) Write each statement as an equation in two variables.

a. The y-value is twice the x-value.  $y = 2x$

b. Five times the x-value, added to twice the y-value is negative ten.

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

Simplify the following slope expressions. State what they mean in terms of slope.

75)  $\frac{4-5}{-1-0} = \frac{-1}{-1} = 1$

moves  $\uparrow 1 \rightarrow 1$

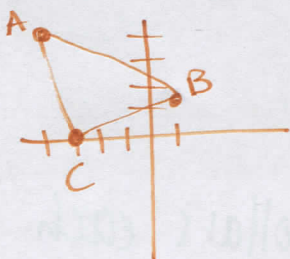
76)  $\frac{12-3}{10-9} = \frac{9}{1} = 9$

moves  $\uparrow 9 \rightarrow 1$

77)  $\frac{2-2}{3-5} = \frac{0}{-2}$

horizontal line at 2.

78) Show that the triangle with vertices at the points (1, 1), (-4, 4), and (-3, 0) is a right triangle.



B A C

$AC \perp CB ?$

Slope AC =  $\frac{4-0}{-4-1} = \frac{4}{-5} = -\frac{4}{5}$

Slope CB =  $\frac{0-1}{-3-1} = \frac{-1}{-4} = \frac{1}{4}$

yes  
 $AC \perp CB$   
 so Rt angle!