

Name: _____

Date: _____

Period: _____

Algebra 1 Chapter 4 Study Guide

1. Find the slope of the line that passes through each pair of points.

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

a. (-3,4) and (-3,8)

$$m = \frac{8 - 4}{-3 - -3} = \frac{4}{0}$$

$$m = \text{und}$$

b. (-2, -6) and (-2, 10)

$$m = \frac{10 - -6}{-2 - -2} = \frac{16}{0}$$

$$m = \text{und}$$

2. Write an equation of each line in slope intercept form

$$y = mx + b$$

a. slope: $-\frac{5}{8}$, y-intercept -2

$$y = -\frac{5}{8}x - 2$$

c. passing through (2, -1) and (5, 2)

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

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

$$y + 1 = x - 2$$

$$y = x - 3$$

b. passes through (-3, -1), slope 2

$$y - -1 = 2(x - -3)$$

$$y + 1 = 2(x + 3)$$

$$y + 1 = 2x + 6$$

$$y = 2x + 5$$

d. passing through (2,4) and (7,2)

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

$$y - 4 = -\frac{2}{5}(x - 2)$$

$$y - 4 = -\frac{2}{5}x + \frac{4}{5}$$

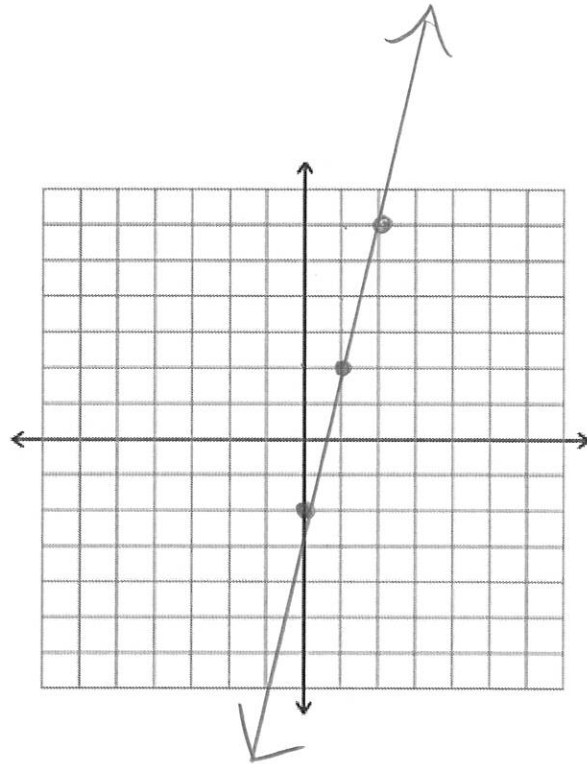
$$y = -\frac{2}{5}x + \frac{4}{5} + 4$$
$$y = -\frac{2}{5}x + \frac{24}{5}$$

3. Write an equation in slope-intercept form for the total cost of skiing for h hours with one lift ticket if a lift ticket costs \$15 per day and ski rentals are \$5 per hour.

$$y = mx + b$$

$$y = 5h + 15$$

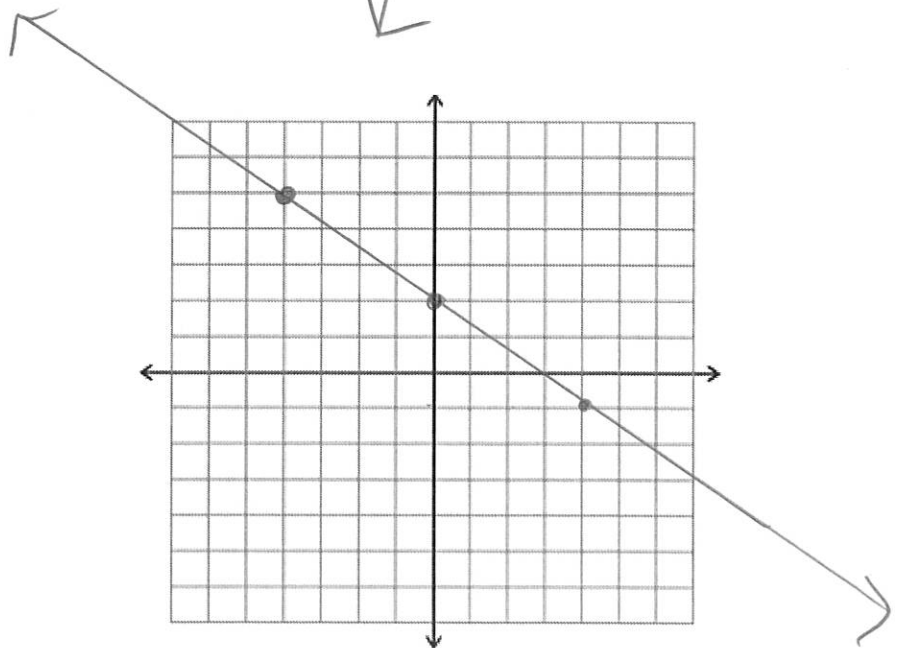
4. Graph $y = 4x - 2$



5. Graph $3x + 4y = 8$

$$\begin{array}{r} 3x + 4y = 8 \\ \underline{-3x \quad -3x} \\ 4y = -3x + 8 \\ \frac{4y}{4} = \frac{-3x}{4} + \frac{8}{4} \end{array}$$

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



6. In 2005, a camp had 450 campers. Five years later, the number of campers rose to 750. Write a linear equation that represents the numbers of campers that attend camp.

$$(0, 450) \quad (5, 750)$$

$$m = \frac{750 - 450}{5 - 0} = \frac{300}{5} = 60$$

$$y - 450 = 60(x - 0)$$

$$y - 450 = 60x + 450$$

$$y = 60x + 450$$

7. Write an equation of each line in point-slope form.

a. (6, 3), slope 5

$$y - 3 = 5(x - 6)$$

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

b. (-4, 2) slope 0

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

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

8. Write each equation in slope-intercept form

a. $y - 3 = 5(x - 2)$

$$y - 3 = 5x - 10$$

$$\begin{array}{r} y - 3 = 5x - 10 \\ +3 \quad \quad +3 \\ \hline y = 5x - 7 \end{array}$$

$$y = mx + b$$

b. $y - 9 = -\frac{4}{5}(x + 10)$

$$y - 9 = -\frac{4}{5}x - \frac{40}{5}$$

$$y - 9 = -\frac{4}{5}x - 8$$

$$\begin{array}{r} y - 9 = -\frac{4}{5}x - 8 \\ +9 \quad \quad +9 \\ \hline y = -\frac{4}{5}x + 1 \end{array}$$

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

Slope parallel = same m

perp. opp recip $m \Rightarrow -\frac{1}{m}$

9. Determine whether the graphs of each pair of equations is parallel, perpendicular, or intersecting/neither.

a.

$$y = -2x + 11 \quad m = -2$$

$$\begin{array}{r} 2y + 4x = 14 \\ -4x \quad -4x \\ \hline \end{array}$$

$$\frac{2y}{2} = \frac{-4x + 14}{2}$$

$$y = -2x + 7 \quad m = -2$$

parallel

c.

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

$$y = -5x - 18 \quad m = -5$$

Neither

b.

$$\frac{3y}{3} = \frac{2x + 15}{3}$$

$$\begin{array}{r} 3x - 2y = 6 \\ -3x \quad -3x \\ \hline \end{array}$$

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

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

$$y = \frac{2}{3}x + 5 \quad m = \frac{2}{3}$$

Neither

d.

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

perpend

$$\frac{3y}{3} = \frac{9x + 18}{3}$$

$$y = 3x + 6 \quad m = 3$$

10. Write an equation in slope-intercept form that passes through the given point and is parallel to the given equation.

a. $(-4, 1)$, $y = -2x - 6$

$$m = -2$$

$$y - 1 = -2(x - (-4))$$

$$y - 1 = -2(x + 4)$$

$$y - 1 = -2x - 8$$

$$\begin{array}{r} y - 1 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} -2x - 8 \\ +8 \\ \hline \end{array}$$

$$y = -2x - 7$$

Same m

b. $(-5, -2)$, $y = \frac{1}{2}x + 4$

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

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

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

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

$$\begin{array}{r} y + 2 \\ -2 \\ \hline \end{array} \quad \begin{array}{r} \frac{1}{2}x + \frac{5}{2} \\ -\frac{3}{2} \\ \hline \end{array}$$

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

11. Write an equation in slope-intercept form that passes through the given point and is perpendicular to the given equation.

a. $(2, 4)$, $y = 3x + 1$

$$m = 3 \Rightarrow -\frac{1}{3}$$

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

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

$$\begin{array}{r} y - 4 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} -\frac{1}{3}x + \frac{2}{3} \\ +\frac{10}{3} \\ \hline \end{array}$$

$$y = -\frac{1}{3}x + 4\frac{2}{3} \quad \left(\frac{14}{3}\right)$$

$m \Rightarrow -\frac{1}{m}$

b. $(-6, 2)$, $y = \frac{2}{3}x + 4$

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

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

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

$$y - 2 = -\frac{3}{2}x - 9$$

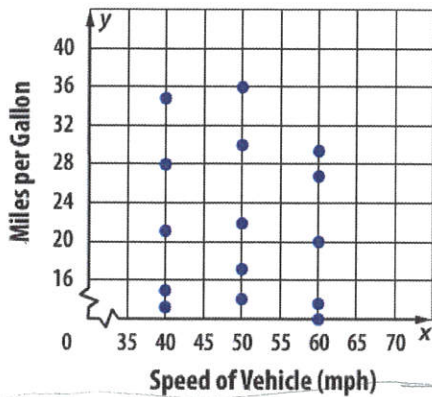
$$\begin{array}{r} y - 2 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} -\frac{3}{2}x - 9 \\ +7 \\ \hline \end{array}$$

$$y = -\frac{3}{2}x - 7$$

12. Determine whether each graph shows a positive, negative, or no correlation and describe its meaning.

a.

Gas Mileage of Various Vehicles

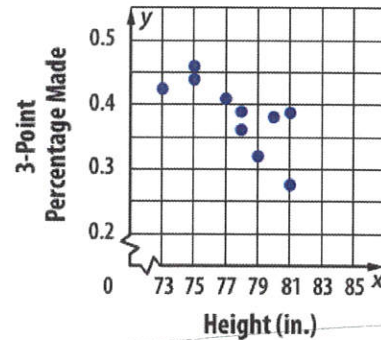


No Correlation
There is no relationship between Speed and miles per gallon.

c.

b.

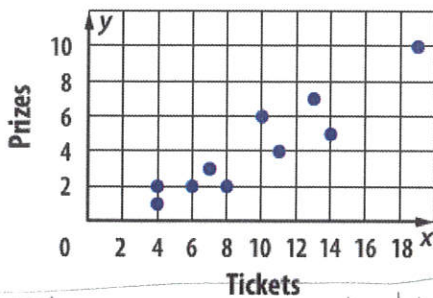
NBA 3-Point Percentage



Negative Correlation
As height increases the 3 pt. percent decreases

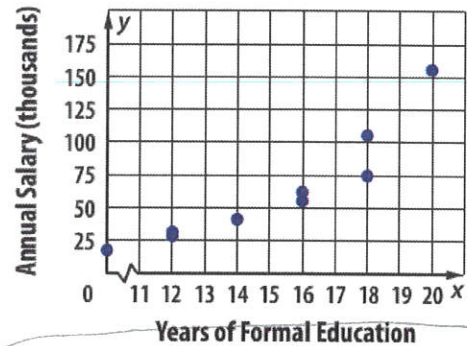
d.

Game Tickets at the Fair



positive correlation
As tickets increase the number of prizes

Salaries



positive correlation
As years of Formal Ed go up so does salary

13. A scatter plot of data compares the number of years since a business has opened and its annual number of sales. It contains the ordered pairs (2, 65) and (5, 1280). Write an equation in slope-intercept form for the line of fit for this situation.

$$y = mx + b$$

$$m = \frac{1280 - 65}{5 - 2} = \frac{1215}{3} = 405$$

$$y - 65 = 405(x - 2)$$

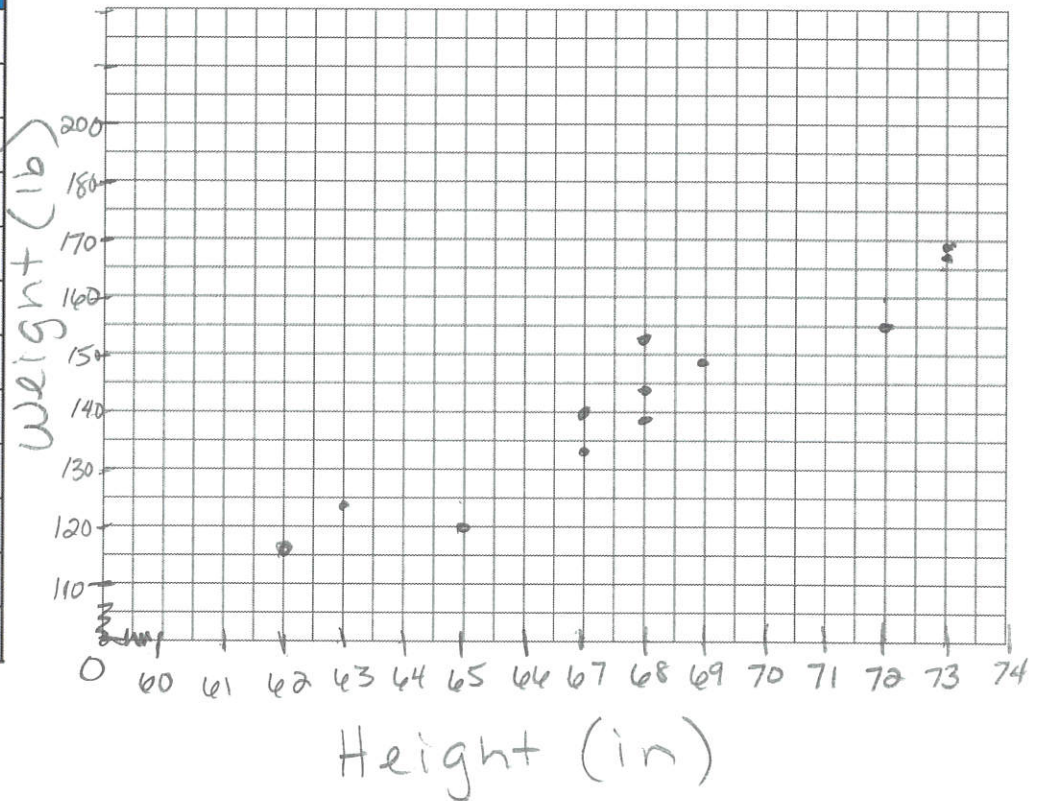
$$y - 65 = 405x - 810$$

$$+65 \qquad \qquad \qquad +65$$

$$y = 405x - 745$$

14. The Body Mass Index (BMI) is a measure of body fat using height and weight. The heights and weight of twelve men with normal BMI are given. Make a scatter plot comparing the height in inches to the weight in pounds

Height (in.)	Weight (lb)
62	115
63	124
65	120
67	134
67	140
68	138
68	144
68	152
69	147
72	155
73	168
73	166



15. The table show the number of purchases made at an outerwear store during a sale. Use your calculator to write an equation of the regression line and estimate the daily purchases on day 10 of sales.

x	Days Since Sale Began	1	2	3	4	5	6	7
y	Daily Purchases	15	21	32	30	40	38	51

$x = 10$

Calc Step
 Stat Edit
 x → L1
 y → L2
 Stat → Calc
 Lin Reg

$$y = ax + b$$

$$a = 5.357142857$$

$$b = 11$$

$$r = 0.9590196924$$

$$y = 5.4x + 11$$

$$y = 5.4(10) + 11$$

$$y = 54 + 11$$

$$y = 65$$

On Day 10 we estimate 65 daily purchases.