

Writing Linear Equations Given 2 Points

Activity

Name

Key gm

Date

Period

1. Blood pressure tends to increase with age. Suppose the normal blood pressure of a 20 year old is 120 and that of a 50 year old is 135. Write the equation of the line.

(Age, Bloodpressure)

- a. What are the independent and dependent variables?

Independent: Age (yrs)

Dependent: Blood pressure

- b. Identify two points on the line that represents this situation.

(20, 120) (50, 135)

- c. Identify the slope. What does it represent in this situation?

X	Y
20	120
50	135

$$\frac{\Delta y}{\Delta x}$$

$$\frac{+15}{+30} = \frac{1}{2}$$

Bloodpressure increases  $\frac{1}{2}$  per year

- d. Write the equation of the line.

$$y - 120 = \frac{1}{2}(x - 20)$$

$$\begin{aligned} y - 120 &= \frac{1}{2}x - 10 \\ +120 & \quad +120 \\ \hline y &= \frac{1}{2}x + 110 \end{aligned}$$

- e. Identify the y-intercept. What does it represent in this situation?

(0, 110) A newborn has a bloodpressure of 110

- f. What is the blood pressure of a 30 year old?  $x = 30$

WS +

$$y = \frac{1}{2}x + 110$$

$$y = \frac{1}{2}(30) + 110$$

$$y = 125$$

bloodpressure 125

- g. How old is a person with blood pressure of 140?  $y = 140$

WS +

$$y = \frac{1}{2}x + 110$$

$$\begin{aligned} 140 &= \frac{1}{2}x + 110 \\ -110 & \quad -110 \\ \hline 30 &= \frac{1}{2}x \end{aligned}$$

$$\begin{aligned} 30 &= \frac{1}{2}x \\ \frac{30}{\frac{1}{2}} &= \frac{\frac{1}{2}x}{\frac{1}{2}} \\ 60 &= x \end{aligned}$$

60 yrs old

- h. What are reasonable domain and range values for this situation?

$$D: TR \geq 0$$

$$R: TR \geq 110$$

2. A man whose foot is 12 inches long wears a shoe size 12. A man whose foot is 10 inches long wears a size 6. Write an equation of the line.

point (        )                                  slope = \_\_\_\_\_                  y-int = \_\_\_\_\_  
 point (        )                                  equation \_\_\_\_\_

Find the slope and write the equation for the line through the given two points in point-slope form. Convert to slope-intercept form.

3.  $m = \frac{5}{5} = 1$   
 (-2, 2) and (3, 7)

$\begin{array}{c|c} x & y \\ \hline -2 & 2 \\ 3 & 7 \end{array} \rightarrow +5$

$y - 7 = 1(x - 3)$

$y - 7 = x - 3$   
 $+7 \quad +7$

$y = x + 4$

4.  $m = \frac{\Delta y}{\Delta x} = \frac{6}{-1} = -6$

(0, 4) and (-1, 10)

$\begin{array}{c|c} x & y \\ \hline 0 & 4 \\ -1 & 10 \end{array} \rightarrow +6$

$y - 4 = -6(x - 0)$

$y - 4 = -6x$   
 $+4 \quad +4$

$y = -6x + 4$

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

$\begin{array}{c|c} x & y \\ \hline 4 & 5 \\ 5 & 2 \end{array} \rightarrow -3$

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

$y - 5 = -3x + 12$   
 $+5 \quad +5$

$y = -3x + 17$

6.  $m = \frac{11}{0} = \text{undefined}$   
 (7, -4) and (7, 7) vertical graph

$\begin{array}{c|c} x & y \\ \hline 7 & -4 \\ 7 & 7 \end{array} \rightarrow +11$

$x = 7$

7.  $m = \frac{0}{8} = 0$  vertical  
 (4, -2) and (-6, -2)

$\begin{array}{c|c} x & y \\ \hline 4 & -2 \\ -6 & -2 \end{array} \rightarrow 0$

$y = -2$

8.  $m = \frac{-7}{3}$   
 (-2, 6) and (3, -1)

$\begin{array}{c|c} x & y \\ \hline -2 & 6 \\ 3 & -1 \end{array} \rightarrow -7$

$y + 1 = \frac{-7}{3}(x - 3)$

$y + 1 = \frac{-7}{3}x + 4.2$   
 $-1 \quad -1$

$y = \frac{-7}{3}x + 3.2$   
 $y = -1.4x + 3.2$

STAT EDIT  
 STAT CALC  
 4: LIN REG  
 a = -1.4  
 b = 3.2