

# Chapter 4

Write the following formulas

- Slope
- Point Slope Form
- Slope Intercept Form

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

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

$$y = mx + b$$

Write an equation in point-slope form of the line that passes through the given points. ① FIND SLOPE ② CHOOSE POINT

⑦  $\frac{7-1}{-2-4} = \frac{6}{-6} = -1 = m$  (4, 1)  
 $y - 1 = -1(x - 4)$

⑧  $\frac{0-3}{-3-1} = \frac{-3}{-4} = \frac{3}{4} = m$  (1, 3)  
 $y - 3 = \frac{3}{4}(x - 1)$

⑨  $\frac{-1-5}{4-2} = \frac{-6}{2} = -3 = m$  (4, -1)  
 $y + 1 = -3(x - 4)$

⑪  $m = \frac{-3-5}{2-4} = \frac{-8}{-2} = 4 = m$  (2, -3)  
 $y + 3 = 4(x - 2)$

Write a linear function (slope intercept)  $f$  with the given values.

10.  $f(0) = 2, f(3) = -1$  (0, 2) (3, -1)  
 $m = \frac{-1-2}{3-0} = \frac{-3}{3} = -1$   
 $y - 2 = -1(x - 0)$   
 $y - 2 = -1x + 0$   
 $y = -1x + 2$

12. To rent office space for your business, you must pay a one-time fee of \$1000 and pay rent of \$800 per month.

- a. Write a linear model that represents the total cost of renting office space as a function of the number of months you will rent.

$$y = 800m + 1000$$

- b. Find the total cost of renting office space for one year.

12 months in a year.

$$y = 800(12) + 1000$$

$$y = 9600 + 1000$$

$$y = 10,600$$

- c. A different building has office space for rent that does not require a one-time fee, but you must pay rent of \$900 per month. If you have \$15,000, at which building can you rent office space for the greatest amount of time? Explain.

\* BLDG A =  $\frac{15,000 - 1,000}{800} = 17.5m$

BLDG B

$$15,000 \div 900 = 16\frac{2}{3}m$$

13. The table shows the distance covered by a spaceship in outer space. Can the situation be modeled by a linear equation? Explain. If possible, write a linear model that represents the distance traveled as a function

Time (seconds)	1	4	7	10	13
Distance (miles)	5	20	35	50	65

$$y = \frac{15}{3}x + 0$$

$$y = 5x$$

$m = 5$  (1, 5)  
 $y - 5 = 5(x - 1)$   
 $y - 5 = 5x - 5$   
 $y = 5x$

Write the slope-intercept form of the equation with the given characteristics.

14. slope =  $\frac{2}{5}$ ; passes through (-3, 1)

point & slope  
 $y - 1 = \frac{2}{5}(x - (-3))$   
 $y - 1 = \frac{2}{5}x + \frac{6}{5}$   
 $y = \frac{2}{5}x + \frac{11}{5}$

15. passes through (3, 5) and (-1, 5)

find slope & point  
 $\frac{5-5}{-1-3} = \frac{0}{-4} = 0$   
 $m = 0$   
 $y - 5 = 0(x - 3)$   
 $y - 5 = 0x - 0$   
 $y = 5$

16. slope =  $\frac{1}{2}$ ; x-intercept = 3

slope & intercept  
 $y = mx + b$   
 $y = \frac{1}{2}x + 3$

17. slope = -3; passes through (4, -7)

point & slope  
 $y - (-7) = -3(x - 4)$   
 $y + 7 = -3x + 12$   
 $y = -3x + 5$

Determine if the sequence is arithmetic. If so, find the common difference.

18.  $-3, -1, 3, 5, \dots$   $\frac{5}{2}; -\frac{3}{4}; -\frac{1}{4}$  19.  $-1, -7, -13, -19, \dots$   $-\frac{19}{6}; -\frac{13}{6}; -\frac{7}{6}$

20.  $-\frac{1}{6}, \frac{1}{6}, \frac{1}{2}, \frac{5}{6}, \dots$   $\frac{5}{6} - \frac{1}{2} = \frac{2}{6} = \frac{1}{3}; \frac{1}{2} - \frac{1}{6} = \frac{1}{3}; \frac{1}{6} - -\frac{1}{6} = \frac{2}{6} = \frac{1}{3}$  21.  $-1.2, -0.1, 0.8, 1.7, \dots$   $\frac{1.7}{0.8}; \frac{0.8}{-0.1}; -\frac{0.1}{-1.2}$

22. The table shows the number of women (in millions) in the U.S. work force at various times during the past century.

Year, $x$	1900	1920	1930	1950	1970	1990
Number, $y$	5	8	10	16	31	57

- a. Make a scatter plot of the data. Describe the correlation.

POSITIVE CORRELATION

- b. Find an equation of the line of best fit.

$1920, 8$   $1950, 16$   $m = \frac{16-8}{1950-1920} = \frac{8}{30} = \frac{4}{15}$

- c. Determine the number of women in the workforce in the year 2005.

$y = \frac{4}{15}(2005) - 504$   
 $534.67 - 504 = 30.67$

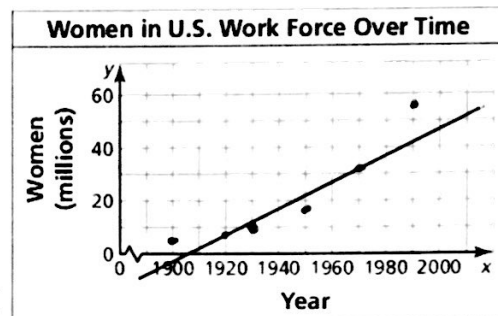
- d. Estimate the correlation coefficient.

SINCE IT IS POSITIVE IT WILL BE BETWEEN 0 AND 1. IT WILL BE CLOSER TO 1 BECAUSE IT IS RELATIVELY STRONG

Tell whether a correlation is likely in the situation. Explain your reasoning.

23. the amount of gas in a car's tank and the number of miles driven  
 24. the height of a person and the length of the person's hair

NO. A PERSON'S HEIGHT HAS NOTHING TO DO WITH HOW LONG THEIR HAIR IS.



$y - 8 = \frac{4}{15}(x - 1920)$   
 $y - 8 = \frac{4}{15}x - 512$   
 $y + 8 = \frac{4}{15}x - 504$

30.67 women

$y = \frac{4}{15}x - 504$

YES. THE MORE MILES YOU DRIVE, THE LESS GAS IN YOUR TANK.