

Algebra Prep Chapter 5 Self Assessment

$$y = mx + b$$

1. Write an equation in slope-intercept form of the line with slope $\frac{1}{3}$ and y-intercept -4 .

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

Write an equation for the function in the form $f(x) = mx + b$.

2. $f(-4) = -33, f(0) = -5$ \swarrow y-int.

$(-4, -33)$ $(0, -5)$
 x_1, y_1 x_2, y_2

$$m = \frac{-5 - (-33)}{0 - (-4)} = \frac{28}{4} = 7$$

$$y = 7x - 5$$

3. Write an equation, in slope-intercept form, that passes through point $(-4, -3)$ with slope 3.

$$y = mx + b$$

$$-3 = 3(-4) + b$$

$$-3 = -12 + b$$

$$9 = b$$

$$y = 3x + 9$$

4. Write an equation of the line containing the points $(-6, 19)$ and $(-15, 28)$.

$$m = \frac{19 - 28}{-6 - (-15)} = \frac{-9}{9} = -1$$

x_2, y_2 x_1, y_1

$$y - 19 = -1(x + 6)$$

$$y - 19 = -x - 6$$

$$y = -x + 13$$

5. Write an equation, in point-slope form, of the line that passes through the point $(6, -5)$ and has the slope $\frac{1}{2}$.

$$y + 5 = \frac{1}{2}(x - 6)$$

6. Write an equation in point-slope form of the line that passes through the points
- $(-5, -4)$
- and
- $(6, 3)$
- .

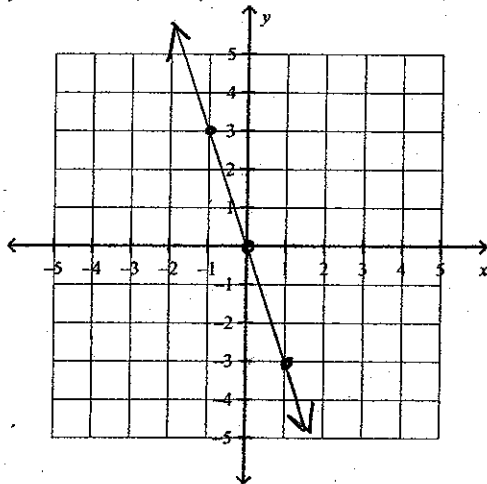
$$m = \frac{3 - (-4)}{6 - (-5)} = \frac{7}{11}$$

$$\text{OR } \boxed{\begin{aligned} y - 3 &= \frac{7}{11}(x - 6) \\ y + 4 &= \frac{7}{11}(x + 5) \end{aligned}}$$

$$\begin{matrix} (-5, -4) & & (6, 3) \\ x_1, y_1 & & x_2, y_2 \end{matrix}$$

Graph the equation.

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



$$\text{point} \\ (-1, 3)$$

$$\text{slope} \\ m = -3$$

8. Write the standard form of the equation of the line with slope
- -1
- passing through the point
- $(-4, -6)$
- .

$$y + 6 = -1(x + 4)$$

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

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

$$\boxed{x + y = -10}$$

$$y = mx + b$$

$$-6 = (-1)(-4) + b$$

$$-6 = 4 + b$$

$$-4 - 4$$

$$-10 = b$$

$$y = -1x - 10$$

$$+x \quad +x$$

$$x + y = -10$$

9. Write the equation of the horizontal line passing through the point
- $(7, 4)$
- .

$$\boxed{y = 4}$$

10. Write the equation of the vertical line passing through the point
- $(-5, 2)$
- .

$$\boxed{x = -5}$$

11. Write an equation of the line that passes through $(-5, -1)$ and is parallel to the line $y = 4x - 6$.

$$m_{\parallel} = 4$$

$$y = mx + b$$

$$-1 = 4(-5) + b$$

$$-1 = -20 + b$$

$$19 = b$$

$$y = 4x + 19$$

12. Write an equation of the line that goes through the point $(3, 7)$ and is perpendicular to the line $y = -3x + 6$.

$$m_{\perp} = \frac{1}{3}$$

$$7 = \frac{1}{3}(3) + b$$

$$7 = 1 + b$$

$$6 = b$$

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

13. Good Woods, Inc. is having a furniture sale. All dining room tables are on sale for \$300 each and all chairs are on sale for \$50 each. Assume there is no sales tax. A customer has \$600 to spend at the sale. Write an equation (in standard form) that represents this situation. Then graph the possible numbers of tables and chairs the customer can buy. Explain what the intercepts mean in this situation.

$$x = \# \text{ of tables}$$

$$y = \# \text{ of chairs}$$

$$300x + 50y = 600$$

$$x\text{-int. let } y = 0$$

$$300x + 50(0) = 600$$

$$300x = 600$$

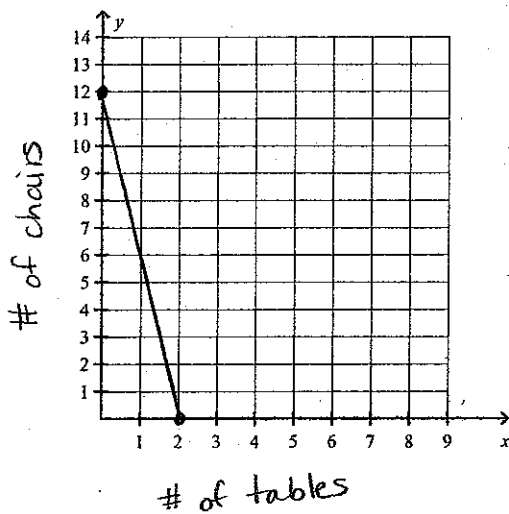
$$x = 2$$

$$y\text{-int. let } x = 0$$

$$300(0) + 50y = 600$$

$$50y = 600$$

$$y = 12$$



The x-intercept means you could buy 2 tables and no chairs. The y-intercept means you could purchase 12 chairs and no table.

Name: _____

ID: A

14. An amusement park charges \$9.00 for admission and \$4.00 per ride. Write an equation that gives the cost (in dollars) as a function of number of rides.

one time fee rate

$$y = 4x + 9$$

15. If a large factory sells its new gadgets for \$5 each, it can sell 1050 per month, and if it sells the same gadgets for \$9, it will sell 900 per month. Assuming the relationship between price and sales is linear, predict the monthly sales of gadgets to the nearest whole number if the price is \$12.

$$\begin{aligned} (5, 1050) \\ (9, 900) \end{aligned}$$

$$m = \frac{1050 - 900}{9 - 5} = \frac{150}{4} = 37.5$$

$$900 = 37.5(9) + b$$

$$900 = 337.5 + b$$

$$562.5 = b$$

$x = \text{price } (\$)$
 $y = \# \text{ of sold gadgets}$

$$y = 37.5x + 562.5$$

$$y = 37.5(12) + 562.5$$

$$y = 450 + 562.5$$

$$y = 1012.5$$

If the price is \$12,
then the factory
should sell $1,012\frac{1}{2}$ gadgets.

16. The table shows the cost of having a pizza party at a local restaurant.

Number of people	2	4	6	8	10
Cost (dollars)	16	28	40	52	64

- a. Find the rate of change for consecutive data pairs in the table (Find the slope between each pair of points).

$$m = \frac{28-16}{4-2} = \frac{12}{2} = 6$$

$$m = \frac{64-52}{10-8} = \frac{12}{2} = 6$$

$$m = \frac{40-28}{6-4} = \frac{12}{2} = 6$$

$$m = \frac{52-40}{8-6} = \frac{12}{2} = 6$$

→ slope = 6

- b. Can the data be modeled by a linear equation? Justify your answer. (Tell me why or why not?)

The data can be modeled by a line because the average rate of change is constant.

- c. Write an equation that gives the cost as a function of the number of people (think about which form should you use).

$$y = mx + b$$

$$m = 6$$

$$16 = 6(2) + b$$

$$16 = 12 + b$$

$$4 = b$$

$$y = 6x + 4$$

- d. Use the equation to find the cost for 7 people.

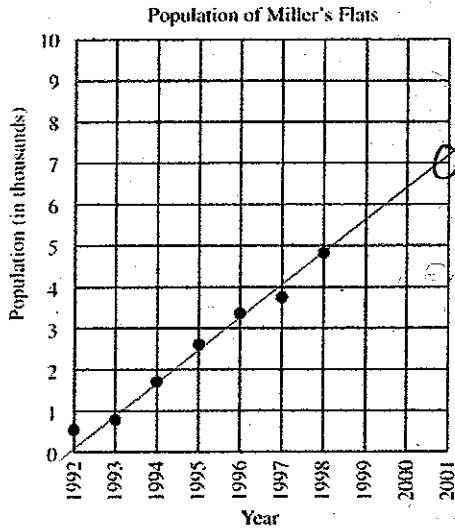
$$y = 6(7) + 4$$

$$y = 42 + 4$$

$$y = 46$$

The banquet will cost \$46 if 7 people attend.

- b 17. The graph below shows the population of a 5-square-mile area called Miller's Flats, just outside a city's Urban Growth Boundary, from 1992 to 1998.

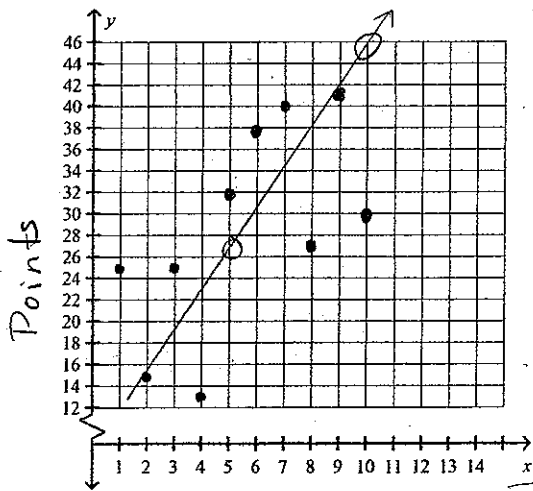


Assume that the population of the Miller's Flats area continues to grow at a fairly steady rate as shown in the graph. What is a good estimate of the population in 2001?

- a. 3500 to 4500 c. 8500 to 9500
 b. 6500 to 7500 d. 4500 to 5500
18. This year the Wolverine football team scored the following number of points in its 10 games.

Game	1	2	3	4	5	6	7	8	9	10
Points	25	15	25	13	32	38	40	27	43	30

- a. Make a scatter plot of the ten data points. Let x = the game number and y = the number of points scored during the game.



(11, 46)
(5, 27)

$$m = \frac{46 - 27}{11 - 5} = \frac{19}{6}$$

$$y - 27 = \frac{19}{6}(x - 5)$$

$$y - 27 = \frac{19}{6}x - \frac{95}{6}$$

$$y - \frac{162}{6} = \frac{19}{6}x - \frac{95}{6}$$

$$y = \frac{19}{6}x + \frac{67}{6}$$

$$\approx y = 3.17x + 11.17$$

- b. Find a line of fit. Graph the line on the scatter plot in part (a). Write an equation for the line using two points on the line.

(see above)

$$y = 2.05x + 17.53$$