

# Key

## Chapter 3 Review

Match each definition to its corresponding term.

- ~~a.~~ rate of change
- ~~b.~~ per
- ~~c.~~ run
- ~~d.~~ rate
- ~~e.~~ unit rate
- ~~f.~~  $\frac{\text{rise}}{\text{run}}$
- ~~g.~~ rise

- e 1. rate which has a second term of 1 unit
- d 2. ratio in which the units of the quantities being compared are different
- g 3. the vertical change from one point to another point on a graph
- a 4. phrase used when a rate is used to describe a rate of increase (or decrease) in a real-life situation
- f 5. the rate of change on a graph written as the vertical change from one point to another over the horizontal change of the same two points
- b 6. means "for each" or "for every"
- c 7. the horizontal change from one point to another point on a graph

Define the term in your own words.

- 8. first differences When you find the differences in the y values in a table and x values
- 9. slope  $\text{rise/run}$
- 10. slope-intercept form  $y = mx + b$
- 11. y-intercept where graph crosses y-axis (0, b)
- 12. direct variation relationship between x and y that have a constant ratio

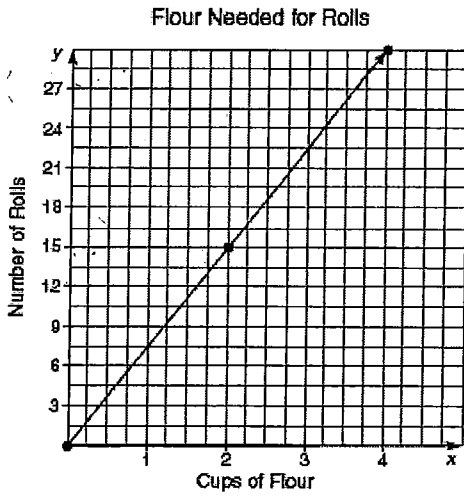
\* rate of change = slope

Chapter 3 Review

Slope Formula  

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

1. The graph shows the number of cups of flour needed for making rolls.

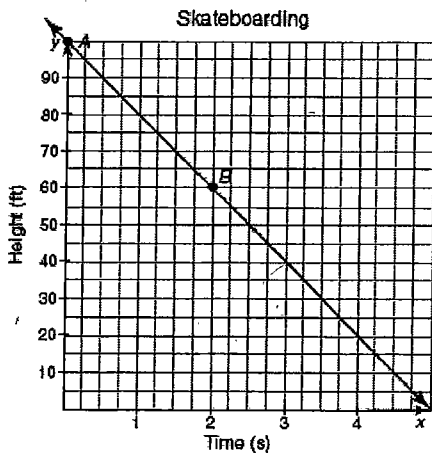


$$\frac{15 \text{ rolls}}{2 \text{ cups}}$$

- Determine the rate of change.
- Determine the number of cups of flour needed to make 75 rolls for a dinner party. Show your work.

$$\frac{15}{2} = \frac{75}{x}$$

2. Kodiak is riding her skateboard down a hill, as shown on the graph.



x = 10 cups

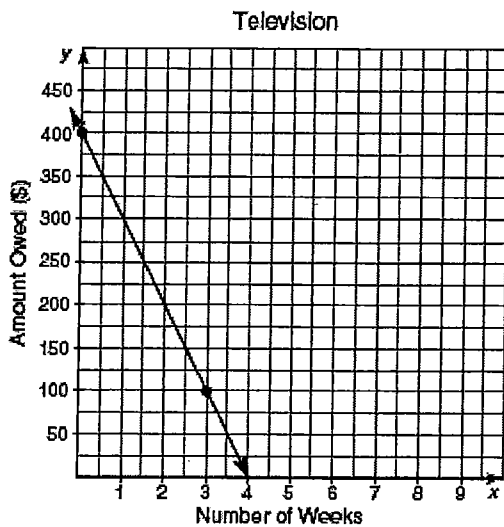
(0, 100)

- Explain what point A represents. 100 ft at the start
- Explain what point B represents. (2, 60) at 2 seconds, they're at 60 ft.
- How many seconds will it take Kodiak to reach the bottom of the hill? 5 sec.
- How many feet down the hill is Kodiak skateboarding per second?

(0, 100) and (5, 0)  

$$\frac{0 - 100}{5 - 0} = \frac{-100}{5} = \frac{-20 \text{ ft}}{1 \text{ sec}}$$

3. The graph shows the amount that Roger still owes on a television he bought. Determine the rate of change.



$$(0, 400) + (4, 0)$$

$$\frac{0 - 400}{4 - 0} = \frac{-400}{4 \text{ weeks}} =$$

$$\frac{\$ -100}{1 \text{ week}}$$

4. Leroy has already accumulated 24 hours of paid time off from his job. The table shows the total number of hours of paid time off that Leroy can continue to accumulate after working various numbers of weeks.

	Number of Weeks Worked	Number of Hours of Paid Time Off
2	0	24
	2	31.5
4	6	46.5
10	16	84
20	36	159

$$\frac{7.5}{2}$$

$$7.5 \frac{15}{4} = \frac{7.5}{2}$$

$$15$$

$$37.5 \frac{37.5}{10} = \frac{7.5}{2}$$

$$75$$

$$\frac{75}{20} = \frac{7.5}{2}$$

- Calculate the rate of change.  $\frac{7.5}{2}$
- Explain why the graph is linear. Same rate of change for each pair
- Name the independent and dependent variables in this problem situation. (x and y)  
I: # of weeks    D: # of hours
- Determine the domain of this problem situation. (List them out)  
D: (0, 2, 6, 16, 36)
- Determine the range of this problem situation. (List them out)  
R: (24, 31.5, 46.5, 84, 159)

5. The table shows the points the Bulldogs scored after various minutes of game play have elapsed. Calculate the rate of change using an informal method.

Number of Minutes of Game Played	Number of Points Scored
5	10
8	16
14	28
22	44

$$\frac{6}{3} = 2$$

$$\frac{12}{6} = 2$$

$$\frac{16}{8} = 2$$

6. Solve for Y. Examine each and determine the y-intercept and slope.

a.  $-9x + 2y = -36$

$$\begin{aligned} & -9x + 2y = -36 \\ & \quad \quad \quad +9x \quad \quad \quad +9x \\ \hline & \quad \quad \quad 2y = 9x - 36 \\ & \quad \quad \quad \frac{2y}{2} = \frac{9x}{2} - \frac{36}{2} \\ & \quad \quad \quad y = \frac{9}{2}x - 18 \end{aligned}$$

b.  $y + 5 = -7(x + 3)$

$$\begin{aligned} & y + 5 = -7(x + 3) \\ & y + 5 = -7x - 21 \\ & \quad \quad \quad -5 \quad \quad \quad -5 \\ \hline & y = -7x - 26 \end{aligned}$$

b.  $y + 5 = -7(x + 3)$

**Slope-Intercept Form**  
**Determining the Rate of Change and y-Intercept**

7. Calculate the y-intercept of each line when given the slope and one point that lies on the line. Show your work. (Remember to use  $y = mx + b$ )

a.  $m = 2; (5, 6)$

$$\begin{aligned} & 6 = 2(5) + b \\ & 6 = 10 + b \\ & \quad \quad \quad -10 \quad \quad \quad -10 \\ \hline & \quad \quad \quad b = -4 \end{aligned}$$

b.  $10 = -9.2(-17) + b$

$$\begin{aligned} & 10 = -9.2(-17) + b \\ & 10 = 156.4 + b \\ & \quad \quad \quad -156.4 \quad \quad \quad -156.4 \\ \hline & \quad \quad \quad -146.4 = b \end{aligned}$$

b.  $m = -9.2; (-17, 10)$

8. Write the equation of a line using the given two points that lie on the line. Find slope and then the y-int, use  $y = mx + b$

a.  $(-2, 3), (8, 8)$

$$\begin{aligned} & m = \frac{8 - 3}{8 - (-2)} = \frac{5}{10} = \frac{1}{2} \end{aligned}$$

b.  $(50, 52), (81, 79)$

$$\begin{aligned} & m = \frac{79 - 52}{81 - 50} = \frac{27}{31} \end{aligned}$$

b.  $(79, 52), (-87, 550)$

$$\begin{aligned} & -8 = -\frac{1}{2}(8) + b \\ & \quad \quad \quad +4 \quad \quad \quad +4 \\ \hline & \quad \quad \quad -4 = b \end{aligned}$$

$52 = -3(79) + b$

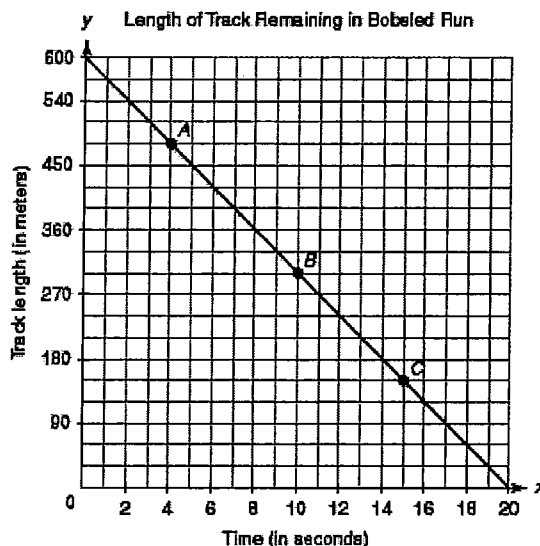
$$\begin{aligned} & 52 = -237 + b \\ & \quad \quad \quad +237 \quad \quad \quad +237 \\ \hline & \quad \quad \quad -185 = b \end{aligned}$$

**Problem Set**

Write a rate for each situation. (slope) Remember to reduce and label

$$-289 = b$$

9. Use the graph to write a rate that compares the track length to the change in time at point A.



$$(0, 600) + (20, 0)$$

$$\frac{0 - 600}{20 - 0} = \frac{-600}{20}$$

$$\frac{-30 \text{ meters}}{1 \text{ second}}$$

### Problem Set

Find the slope and determine if the points given are linear. Your answer should be slope AND Linear or Not Linear.

10.

Number of Balloons	Total Cost of Balloons (in Dollars)
2	6
4	12
6	18
8	24

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

linear -  
Same rate of  
change for each  
pair

11.

Number of Lawns	Total Earned (in Dollars)
3	25.50
5	42.50
7	59.50
9	76.50

$$m = \frac{17}{2}$$

linear -  
Same slope  
for each pair

Determine the slope and y-intercept of the line represented by each equation. (the m and the b)

12.  $y = 4x + 5 + 2x$

12.  $y = \underset{\text{m}}{6}x + \underset{\text{b}}{5}$

13.  $y = 3x + 8 - 12x$

13.  $y = \underset{\text{m}}{-9}x + \underset{\text{b}}{8}$

14.  $2x + 3y = 21$

14.  $2x + 3y = 21$   
 $\quad \quad \quad -2x \quad \quad \quad -2x$

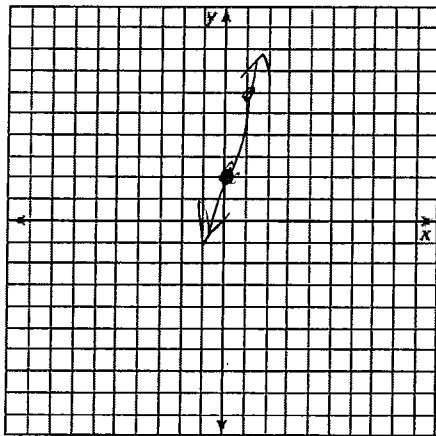
$\frac{3y}{3} = \frac{-2x}{3} + \frac{21}{3}$

$y = \underset{\text{m}}{-\frac{2}{3}}x + \underset{\text{b}}{7}$

Graph the equation. Determine the slope and y-intercept.

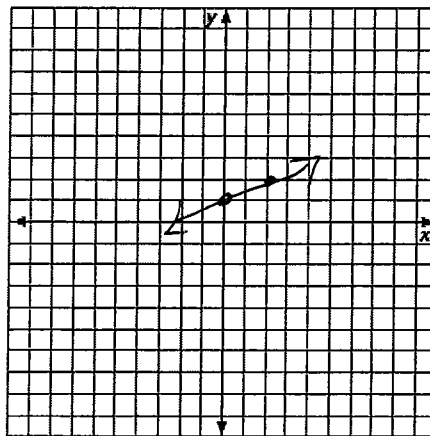
15.  $y = 4x + 2$

$m = \frac{4}{1}$   
 $b = 2$

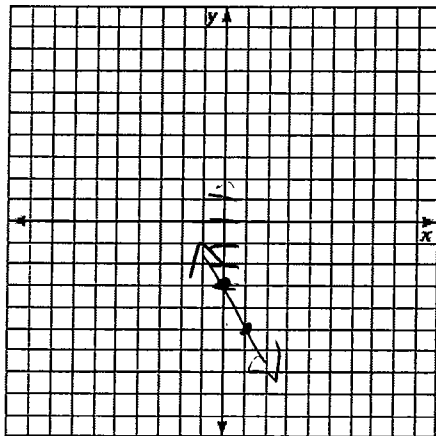


16.  $y = \frac{1}{2}x + 1$

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



17.  $y = -2x - 3$



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

Determine the y-intercept and slope.

18.  $\frac{3x + 7y = 63}{-3x \quad -7y}$

$$18. \frac{7y = -3x + 63}{7} \quad \frac{7y}{7} = \frac{-3x}{7} + \frac{63}{7}$$

$$y = \left(\frac{-3}{7}\right)x + 9$$

(m)                      (b)

19.  $5x - 4y = 120$

19.  $\frac{5x - 4y = 120}{-5x \quad -5x}$

$$\frac{-4y = -5x + 120}{-4} = \frac{-5x}{-4} + \frac{120}{-4}$$

$$y = \left(\frac{5}{4}\right)x + (-30)$$

(m)                      (b)

Determine the y-intercept of each line given the slope and a point that lies on the line.

20.  $m = 4$  and  $(2, 13)$

$$20. 13 = 4(2) + b$$

$$\quad \quad \quad -8 \quad -8$$

21.  $-b = \frac{3}{2}(4) + b$

$$\quad \quad \quad -b \quad -b$$

21.  $m = \frac{3}{2}$  and  $(4, -6)$

$$5 = b$$

$$-12 = b$$

Write the equation of each line given two points that lie on the line. Remember to find the slope and then the y-intercept. Use  $y = mx + b$ .

22.  $(3, 25)$  and  $(4, 31)$

$$\frac{31 - 25}{4 - 3} = \frac{6}{1} = b = m$$

$$\frac{25 = 3(b) + b}{-18 \quad -18}$$

$$7 = b$$

$$y = 6x + 7$$

23.  $(10, 22)$  and  $(15, 24)$

$$\frac{24 - 22}{15 - 10} = \frac{2}{5} = m$$

$$22 = 10\left(\frac{2}{5}\right) + b$$

$$\quad \quad \quad -4 \quad -4$$

$$b = 18$$

$$y = \frac{2}{5}x + 18$$

Write the equation of each line given the slope and a point that lies on the line. Write the equation in slope-intercept form ( $y = mx + b$ ). First find the y-intercept and then plug into the slope-intercept form.

24. slope = 9 and  $(2, 21)$

$$\frac{21 = 9(2) + b}{-18 \quad -18}$$

$$b = 3$$

$$y = 9x + 3$$

25. slope = -2 and  $(4, 7)$

$$\frac{7 = -2(4) + b}{+8 \quad +8}$$

$$15 = b$$

$$y = -2x + 15$$

