NAME



Practice Functions

Determine whether each relation is a function. Explain.

1.
$$\{(4, -5), (0, -9), (1, 0), (7, 0)\}$$

2. $\{(5, -12), (-1, -2), (8, -5), (4, -2), (3, -5)\}$

3. $\{(-2, -3), (6, -8), (4, 2), (6, -5), (2, -5)\}$ **4.** $\{(5, 2), (-2, 15), (-7, 15), (1, 5), (4, 15), (-7, 2)\}$

5.	x	4	-5	11	-5	23	1
	у	-3	1	1	0	6	

7.	x	-3.0	3.5	4.1	-3.0	3.4
	у	4.2	3.7	-3.8	3.7	4.0

6.	x	7	14	11	-10	-1
	у	-3	-9	-4	-3	15

8.	x	11	4	-2	4	-7
	у	-7	-2	2	2	6

EMPLOYMENT Fo	r Exercises 9–12, use the
table, which show	s the percent of employed
men and women i	n the U.S. labor force
every five years fi	rom 1980 to 2000.

- 9. Is the relation (year, percent of men) a function? Explain.
- 10. Describe how the percent of employed men is related to the year.

Employed Members of Labor Force							
Year	Men (% of male population)	Women (% of female population)					
1980	77.4	51.5					
1985	76.3	54.5					
1990	76.4	57.5					
1995	75.0	58.9					
2000	78.9	67.3					

Source: U.S. Census Bureau

11. Is the relation (year, percent of women) a function? Explain.

12. Describe how the percent of employed women is related to the year.

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8-2

Practice Linear Equations in Two Variables

Find four solutions of each equation. Write the solutions as ordered pairs.

2. y = -7**3.** y = -3x + 1**1.** y = x - 55. y = 2x + 46. 7x - y = 14**4.** x - y = 6

Graph each equation by plotting ordered pairs.



			-10 8 6 4 2	0 0				
8	6	4	 2 4 6		2 4	4 (5 8	3



		<i>y</i> 0	
8 6 4	22 	24	68

COOKING For Exercises 13–15, use the following information.

Kirsten is making gingerbread cookies using her grandmother's recipe and needs to convert grams to ounces. The equation y = 0.04x describes the approximate number of ounces *y* in *x* grams.

13. Find three ordered pairs of values that satisfy this equation.

- 14. Draw the graph that contains these points.
- **15.** Do negative values of *x* make sense in this case? Explain.



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8-3

Practice Graphing Linear Equations Using Intercepts

Find the *x*-intercept and the *y*-intercept for the graph of each equation.

2. y + 4 = 0**3.** v = 3x + 91. y = 2x - 2**4.** 6x + 12y = 245. 5x - 3y = 156. -x - 7 = 0

Graph each equation using the x- and y-intercepts.







10. $y = -\frac{1}{7}x - 1$



11. 5x + 2y = 10



13. SAVINGS Rashid's grandparents started a savings account for him, contributing \$1000. He deposits \$430 each month into the account. The equation y = 430x +1000 represents how much money is in the savings account after *x* number of months. Graph the equation and explain what the *y*-intercept means.

12. x = 2





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Find the slope of each line.



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

4. <i>A</i> (-10, 6), <i>B</i> (-5, 8)	5. <i>C</i> (7, -3), <i>D</i> (11, -4)	6. <i>E</i> (5, 2), <i>F</i> (12, −3)
7. <i>G</i> (-15, 7), <i>H</i> (-10, 6)	8. <i>J</i> (13, 0), <i>K</i> (-3, -12)	9. <i>L</i> (-5, 3), <i>M</i> (-4, 9)
10. <i>P</i> (12, 2), <i>Q</i> (18, -2)	11. $R(-2, -3), S(-2, -5)$	12. <i>T</i> (-13, 8), <i>U</i> (21, 8)

- **13. CAKES** A wedding cake measures 2 feet high in the center and the diameter of the bottom tier is 12 inches. What is the slope of the cake?
- **14. INSECTS** One particularly large ant hill found in 1997 measured 40 inches wide at the base and 18 inches high. What was the slope of the ant hill?
- **15. ARCHAEOLOGY** Today, the Great Pyramid at Giza near Cairo, Egypt, stands 137 meters tall, coming to a point. Its base is a square with each side measuring 230 meters wide. What is the slope of the pyramid?
- **16. BUSINESS** One warehouse uses 8-foot long ramps to load its forklifts onto the flat beds of trucks for hauling. If the bed of a truck is 2 feet above the ground and the ramp is secured to the truck at its end, what is the slope of the ramp while in operation?

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8-5 Practice Rate of Change

Find the rate of change for each linear function.



Suppose *y* varies directly with *x*. Write an equation relating *x* and *y*.

3. $y = -6$ when $x = -2$	4. $y = -27$ when $x = 9$	5. $y = 4$ when $x = 16$
6. $y = 10$ when $x = 2$	7. $y = -42$ when $x = 7$	8. $y = 3$ when $x = 36$
9. $y = 4.5$ when $x = -9$	10. $y = 11$ when $x = 33$	11. $y = 25$ when $x = -5$
12. $y = 63$ when $x = 7$	13. $y = 48$ when $x = -4$	14. $y = 26$ when $x = 13$

TRAFFIC MANAGEMENT For Exercises 15 and 16, use the following information.

San Diego reserves express lanes on the freeways for the use of carpoolers. In order to increase traffic flow during rush hours, other drivers may use the express lanes for a fee. The toll varies directly with the number of cars on the road. The table shows a sample of possible tolls.

- **15.** Write an equation that relates the toll *x* and traffic volume *y*.
- **16.** Predict the number of vehicles at a peak time if the toll increases to \$6.00.
- **17. OFFICE SUPPLIES** The cost of paper varies directly with the number of reams of paper purchased. If 2 reams cost \$9.60, find the cost of 41 reams.

Toll (\$)	Traffic Volume (vehicles/h)
1.00	521
2.00	1042
3.00	1563
4.00	2084

NAME

8-6 **Practice** Slope-Intercept Form

Given the slope and *y*-intercept, graph each line.





3. slope = 1, y-intercept = 5



Graph each equation using the slope and y-intercept.





6. y = -6x + 3

			y		
		0			X
	 		-	-	

EXERCISE For Exercises 7 and 8, use the following information.

A person weighing 150 pounds burns about 320 Calories per hour walking at a moderate pace. Suppose that the same person burns an average of 1500 Calories per day through basic activities. The total Calories y burned by that person can be represented by the equation y = 320x + 1500, where x represents the number of hours spent walking.

7. Graph the equation using the slope and *y*-intercept.



8. State the slope and *y*-intercept of the graph of the equation and describe what they represent.

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Lesson 8-7

NAME

8-7

Practice Writing Linear Functions

Write an equation in slope-intercept form for each line.



Write an equation in slope-intercept form for the line passing through each pair of points.

5.	(9, 0) and $(6, -1)$	6. (8, 6) and (-8, 2)	7. $(7, -5)$ and $(-4, -5)$

BUSINESS For Exercises 11 and 12, use the following information.

Flourishing Flowers charges \$125 plus \$60 for each standard floral arrangement to deliver and set up flowers for a banquet.

- 11. Write an equation in slope-intercept form that shows the cost y for flowers for x number of arrangements.
- **12.** Find the cost of providing 20 floral arrangements.

INSULATION For Exercises 13 and 14, use the following information.

Renata González wants to increase the energy efficiency of her house by adding to the insulation previously installed. The better a material protects against heat loss, the higher its R-value, or resistance to heat flow. The table shows the R-value of fiberglass blanket insulation per inch of thickness. The existing insulation in Renata's attic has an R-value of 10.

13. Write an equation in slope-intercept form that shows the total R-value *y* in the attic if she adds *x* number of inches of additional insulation.

R-value	Thickness (in.)
0.0	0
3.2	1
6.4	2
9.6	3

Source: Oak Ridge National Laboratory

14. Estimate the total R-value in the attic if she adds 6 inches of insulation.

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2. {(5, 212), (21, 22), (8, 25), (4, 22), (3, 25)}

Yes; each x value is paired with

only one y value.

Practice

NAME

8-1

Functions

Determine whether each relation is a function. Explain.

- **1.** $\{(4, 25), (0, 29), (1, 0), (7, 0)\}$
 - Yes; each x value is paired with only one y value.
- **3.** $\{(22, 23), (6, 28), (4, 2), (6, 25), (2, 25)\}$
 - No: 6 in the domain is paired with 8 and 5 in the range.

5.	x	4	5	11	5	23	1
	у	3	1	1	0	6	
	No	5	in th	ne d	oma	in is	paired



3.7

4.2

3.8 No; 3.0 in the domain is paired with 4.2 and 3.7 in the range.

3.7 4.0

- EMPLOYMENT For Exercises 9–12, use the table, which shows the percent of employed men and women in the U.S. labor force every five years from 1980 to 2000.
- 9. Is the relation (year, percent of men) a function? Explain. Yes; each year is paired with only one value for the percent of employed men.
- **10.** Describe how the percent of employed men is related to the year. The number of employed men varies each year. but is around 76 percent of the male population.
- 11. Is the relation (year, percent of women) a paired with only one value for the percent of employed women.
- 12. Describe how the percent of employed women is related to the year. As the years progress, the percent of employed women increases.

 4. {(5, 2), (2 2, 15), (2 7, 15), (1, 5), (4, 15), (2 7, 2)} No; 7 in the domain is paired with 15 and 2 in the range. 						son 8-1				
(в. _х	7	14	11	1	0	1			es
	У	3	9	4		3	15			Ľ
	Yes onl	s; ea y on	chx iey	valu value	ie i e.	s p	baire	d with		
8	^{3.} x	11	4	2	4		7			
	У	7	2	2	2		6			
	No; 4 in the domain is paired with 2 and 2 in the range.									
	1	Empl	oyed I	Nemb	ers	of I	abor	Force		
	Yea	r	Men (% of male population)			۷ %) pol	Vomen of female pulation)			
	1980)		77.4				51.5		
	1985	5		76.3				54.5		
	1990)		76.4				57.5		



.	Employed Members of Labor Force							
	Year	Men (% of male population)	Women (% of female population)					
	1980	77.4	51.5					
	1985	76.3	54.5					
	1990	76.4	57.5					
r	1995	75.0	58.9					
'	2000	78.9	67.3					
	Source: U.S. Census Bureau							
tu:	unction? Explain. Tes; each year is							

Answers

NAME DATE PERIOD 8-1 Reading to Learn Mathematics **Functions** Pre-Activity How can the relationship between actual temperatures and windchill temperatures be a function? Do the activity at the top of page 369 in your textbook. Write vour answers below. a. On grid paper, graph the temperatures as ordered pairs (actual, windchill). **b.** Describe the relationship between the two temperature scales. Sample answer: As the actual temperature increases, the windchill temperature also 25 increases. c. When the actual temperature is 2 20°F, which is the best estimate for the windchill: 2 46°F, 2 28°F, or 0°F? Explain. 46°F; when the actual temperature decreases, the windchill temperature

Reading the Lesson 1–2. See students' work.

also decreases.

Write a definition and give an example of each new vocabulary word or phrase.

Vocabulary	Definition	Example
1. function		
2. vertical line test		

3. For a relation to be a function, each element in the domain must have

only one corresponding element in the range

4. Explain what is meant by the phrase "distance is a function of time." Sample answer: How far something travels depends on how much time elapses.

Helping You Remember

5. You have learned various ways to determine whether a relation is a function. Choose which method is the easiest for you to use, then write a few sentences explaining how that method relates to the other methods. Sample answer: Placing the range values in a table with their corresponding domain values makes it easy to see whether an element in the domain is paired with only one element in the range. By graphing and connecting the points, the vertical line test can be applied to arrive at the same answer.

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Answers

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Example

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	NAME				DATE	PERIOD	
8-5	Rea	ading	to Learn	Math	ematics		
	Rate	of Ch	ange				
Pre-A	ctivity	How are slope and speed related? Do the activity at the top of page 393 in your textbook. Write your answers below.					
		a. For 55	every 1-hour increa mi	ise in time, v	what is the ch	ange in distance?	
		b. Fin	d the slope of the lin	ne. 55			
		c. Ma	ke a conjecture abou	it the relation	onship betwee	n slope of the line	

and speed of the car. Slope is equal to the speed of the car.

Reading the Lesson 1–3. See students' work.

Write a definition and give an example of each new vocabulary phrase.

Vocabulary	Definition	Example
1. rate of change		
2. direct variation		
3. constant of variation		

Complete each sentence.

- 4. Rates of change can be described using slope
- **5.** Direct variation is a special type of **linear** equation.

Helping You Remember

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6. The word *ratio* comes from the Latin word meaning rate and can also mean proportion or relation. Direct variation is often called direct proportion. Look up ratio in the dictionary. Then use this information to explain the relationship between rate of change and direct variation. Sample answers: The rate of change is the ratio of the change in one quantity to the change in another quantity. If the ratio is direct, or proportional, then both quantities vary at the same, or constant, rate. Either they both increase at the same rate or they both decrease at the same rate.

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Answers (Lesson 8-5)

Answers

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Answers

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