Name _____ Date _____

3.1 Puzzle Time

What Has A Foot On Each End And One In The Middle?

Write the letter of each answer in the box containing the exercise number.

Determine whether the relation is a function.

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

   H. yes **I.** no

2. $(2, -3), (3, 2), (4, 7), (5, 14), (6, 23)$

   A. yes **B.** no

3. $(-11, 2), (-9, 2), (-7, 3), (-5, 3), (-3, 3)$

   A. yes **B.** no

4. $(1, -4), (2, 1), (3, 4), (3, 3), (4, 2)$

   B. yes **C.** no

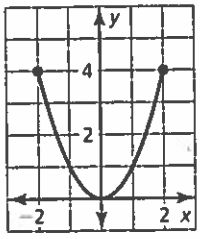
5. $(17, -3), (2, -2), (1, 1), (2, 2), (17, 3)$

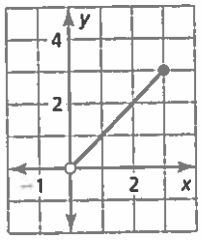
   C. yes **D.** no

6. $(-4, 12), (1, 6), (4, -2), (7, -8), (10, -14)$

   K. yes **L.** no

Find the domain and range of the function represented by the graph.

7. 

8. 

S. $D: 0 \le x \le 4$ $R: -2 \le y \le 2$

T. $D: -2 \le x \le 2$ $R: 0 \le y \le 4$

Q. $D: 0 \le x \le 3$ $R: 0 \le y \le 3$

R. $D: 0 < x \le 3$ $R: 0 < y \le 3$

Use the following information to answer Exercises 9 and 10. The function $t = -8j + 24$ represents the number of tomatoes t that your neighbor has left after making j jars of homemade salsa.

9. Identify the dependent variable.

   R. jars of salsa **S.** tomatoes

10. Identify the independent variable.

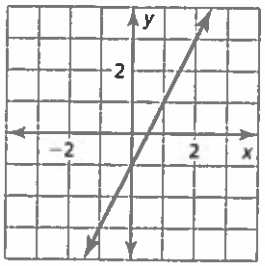
    Y. jars of salsa **Z.** tomatoes

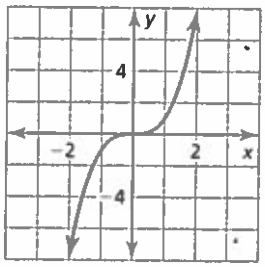
3		10	2	8	5	9	7	1	4	6

Name_____ Date_____

3.2 Practice A

In Exercises 1 and 2, determine whether the graph represents a *linear* or *nonlinear* function. Explain.

1. 

2. 

In Exercises 3 and 4, determine whether the table represents a *linear* or *nonlinear* function. Explain.

3.

x	0	1	2	3
y	3	5	7	9

4.

x	1	4	7	10
y	2	5	6	10

In Exercises 5–8, determine whether the equation represents a *linear* or *nonlinear* function. Explain.

5. $y = \sqrt{x} + 5$

6. $y = 4x - 2$

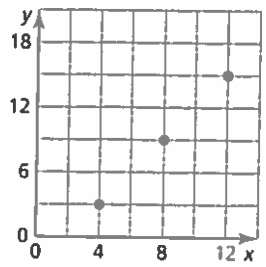
7. $y = 9 - x$

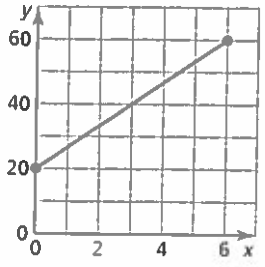
8. $y = (x - 1)(x + 7)$

9. Fill in the table so it represents a linear function.

x	4	8	12	16	20
y	−4				12

In Exercises 10 and 11, find the domain of the function represented by the graph. Determine whether the domain is *discrete* or *continuous*. Explain.

10. 

11. 

Name_____ Date_____

3.3 Puzzle Time

How Does A Bee Get To School?

Circle the letter of each correct answer in the boxes below. The circled letters will spell out the answer to the riddle.

Evaluate the function for the given value of x.

1. $g(x) = x - 7; x = 4$
2. $f(x) = -2x; x = -6$
3. $k(x) = -\frac{3}{4}x - 11; x = -12$
4. $t(x) = 9x + 10; x = -\frac{1}{6}$
5. $g(x) = 15 - \frac{7}{8}x; x = 24$
6. $c(x) = 0.25x - 3; x = 10$
7. $w(x) = 21 - 6x - 13; x = \frac{1}{2}$
8. $p(x) = -\frac{1}{4}(x + 36) - 14; x = -8$

Find the value of x so that the function has the given value.

9. $b(x) = 8x; b(x) = -56$
10. $h(x) = -\frac{5}{6}x; h(x) = 10$
11. $n(x) = 16 - 0.5x; n(x) = 48$
12. $r(x) = \frac{8}{9}x - 17; r(x) = 15$
13. $s(x) = -3\left(x - \frac{2}{3}\right) + 19; s(x) = 0$
14. The local cable company charges \$90 per month for basic cable and \$12 per month for each additional premium cable channel. The function $c(x) = 90 + 12x$ represents the monthly charge (in dollars), where x represents the number of additional premium channels. How many additional premium channels would you have ordered if your bill was \$114 per month?

B	I	V	T	K	T	C	A	J	E	K	I	G	E	O	S
4	5	−10	$\frac{17}{2}$	15	36	3	12	9	0	−21	−4	−13	−7	20	−6

M	T	N	H	S	E	D	B	R	U	F	A	Z	Q	P	Z
13	−0.5	25	2	−9	−2	−1	7	10	−12	−15	−25	−3	1	26	−64

Name_____ Date_____

3.4 Practice A

In Exercises 1–3, graph the linear equation.

1. $x = 4$
2. $y = 3$
3. $x = -3$

In Exercises 4–7, find the *x*- and *y*-intercepts of the graph of the linear equation.

4. $2x - 5y = 10$
5. $3x + 4y = 12$
6. $-3x + 5y = -30$
7. $-6x - 4y = 24$

In Exercises 8–13, use intercepts to graph the linear equation. Label the points corresponding to the intercepts.

8. $2x + 4y = 8$
9. $3x + 2y = 12$
10. $-5x + 2y = 20$
11. $-4x + 4y = 20$
12. $-3x + 4y = 16$
13. $-2x + 6y = 24$

14. A dance team has two competitions on the same day. The coaches decide to split the 96-member team, sending some to each competition. Competition A requires four-member dance teams per event, and Competition B requires six-member dance teams per event. The equation $4x + 6y = 96$ models this situation, where x is the number of four-member teams and y is the number of six-member teams.

    a. Graph the equation. Interpret the intercepts.

    b. Find four possible solutions in the context of the problem.

15. Describe and correct the error in finding the intercepts of the graph of the equation.

✗		
	$4x - 9y = 36$	$4x - 9y = 36$
	$4x - 9(0) = 36$	$4(0) - 9y = 36$
	$4x = 36$	$-9y = 36$
	$x = 9$	$y = -4$

The intercept is at $(9, -4)$.

16. Write an equation in standard form of a line whose intercepts are fractions. Explain how you know the intercepts are fractions.

Name _____ Date _____

3.5 Puzzle Time

What Did The Pelican Say When It Finished Shopping?

Write the letter of each answer in the box containing the exercise number.

Find the slope of the line passing through the given points.

1. $(-10, -12), (-8, -8), (-6, -4), (-4, 0)$
2. $(-4, 2), (0, 1), (4, 0), (8, -1)$
3. $(-7, -7), (0, -8), (7, -9), (14, -10)$
4. $(-2, 2), (0, 3), (2, 4), (4, 5)$
5. $(2, -11), (4, -25), (6, -39), (8, -53)$
6. $(-11, -38), (-5, -14), (1, 10), (7, 34)$

Find the slope and the *y*-intercept of the graph of the linear equation.

7. $y = -4x + 6$
8. $y = -\frac{1}{4}$
9. $4x + y = -1$
10. $y = 6x - 4$
11. $-x - 4y + 8 = 0$
12. $2x - 12y + 10 = 0$
13. The local service center advertises that it charges a flat fee of \$50 plus \$8 per mile to tow a vehicle. The function $C(x) = 8x + 50$ represents the cost C (in dollars) of towing a vehicle, where x is the number of miles the vehicle is towed. Identify the slope and y-intercept.

Answers

I. $m = \frac{1}{2}$

M. $m = 6, b = -4$

U. $m = -\frac{1}{4}$

N. $m = -4, b = -1$

P. $m = -4, b = 6$

I. $m = -7$

L. $m = -\frac{1}{4}, b = 2$

O. $m = 2$

L. $m = 4$

T. $m = 0, b = -\frac{1}{4}$

B. $m = 8, b = 50$

Y. $m = -\frac{1}{7}$

T. $m = \frac{1}{6}, b = \frac{5}{6}$

7	2	12		5	8		1	9		10	3		13	4	11	6

Name_____ Date_____

3.1 Practice B

In Exercises 1 and 2, determine whether the relation is a function. Explain.

1.

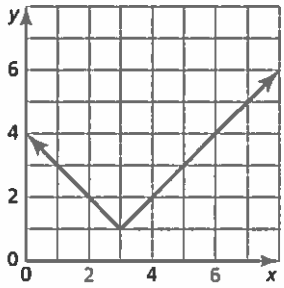
Input, x	0	1	3	2	1
Output, y	1	5	10	15	20

2.

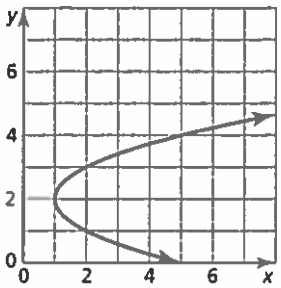
Input, x	0	1	2	3	4
Output, y	−14	−7	0	7	14

In Exercises 3 and 4, determine whether the graph represents a function. Explain.

3.

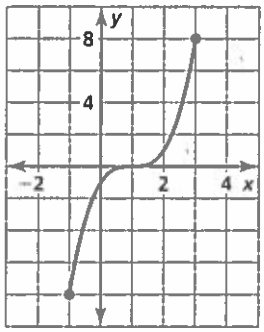


4.

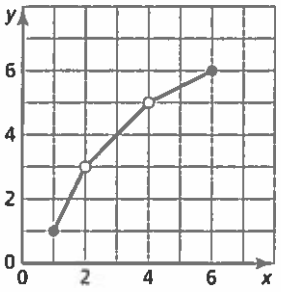


In Exercises 5 and 6, find the domain and range of the function represented by the graph.

5.



6.



7. The function $2x + 1.5y = 18$ represents the number of book raffle tickets x and food raffle tickets y you buy at a club event.

   a. Solve the equation for y.

   b. Make an input-output table to find ordered pairs for the function.

   c. Plot the ordered pairs in a coordinate plane.

In Exercises 8–10, find the domain and range of the function.

8. $y = |x| + 2$

9. $y = -|x| + 1$

10. $y = -|x| - 3$

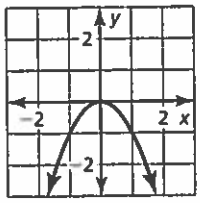
Name _____ Date _____

3.2 Puzzle Time

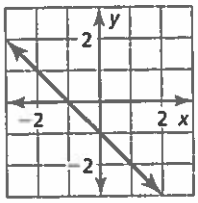
What Do You Get When You Cross A Tortoise And A Porcupine?

Write the letter of each answer in the box containing the exercise number.

Determine whether the graph, table, or equation represents a linear or nonlinear function.

1. 

D. linear E. nonlinear

2. 

O. linear P. nonlinear

3.

x	2	4	6	8
y	21	18	15	12

A. linear B. nonlinear

4.

x	−13	−9	−5	−1
y	27	30	27	22

N. linear O. nonlinear

5. $y = \frac{1}{7}(x - 28) + 16$

W. linear X. nonlinear

6. $y = -2x^2 + 7$

K. linear L. nonlinear

7. $y = 14 - \frac{1}{5}x$

P. linear Q. nonlinear

8. $3 - \frac{1}{9}y = 8x - 11$

K. linear L. nonlinear

9. The function $y = 16 + 0.75x$ represents the cost y (in dollars) of a large pizza with x extra toppings.

S. linear T. nonlinear

3		9	6	2	5	7	4	8	1

Name_____ Date_____

3.3 Practice B

In Exercises 1–3, evaluate the function when $x = -2$, 0, and 5.

1. $f(x) = 1.5x + 1$
2. $g(x) = 11 - 3x + 2$
3. $h(x) = -3 - x - 2$

4. Let $g(x)$ be the percent of your friends with a landline phone x years after 2000. Explain the meaning of each statement.

   a. $g(0) = 100$

   b. $g(5) = g(6)$

   c. $g(10) = m$

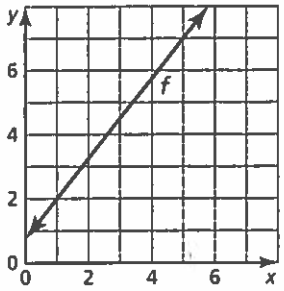
   d. $g(11) > g(12)$.

In Exercises 5–8, find the value of x so that the function has the given value.

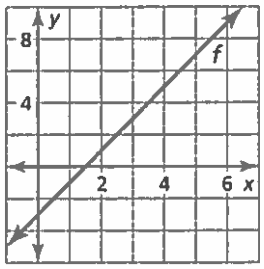
5. $f(x) = 8x - 7; f(x) = 17$
6. $g(x) = -4x + 7; g(x) = 27$
7. $f(x) = \frac{1}{3}x - 1; f(x) = 9$
8. $h(x) = 6 - \frac{2}{3}x; h(x) = -2$

In Exercises 9 and 10, find the value of x so that $f(x) = 7$.

9.



10.



In Exercises 11–14, graph the linear function.

11. $h(x) = -\frac{3}{2}x + 4$
12. $p(x) = \frac{1}{4}x - 1$
13. $v(x) = -5 + 2x$
14. $k(x) = 4 - 3x$

15. The function $C(x) = 35x + 75$ represents the labor cost (in dollars) for Bob's Auto Repair to replace your alternator, where x is the number of hours. The table shows sample labor costs from its main competitor, Budget Auto Repair. The alternator is estimated to take 5 hours of labor. Which company would you hire? Explain.

Hours	1	2	3
Cost	\$90	\$130	\$170

Name _____ Date _____

3.4 Puzzle Time

Why Did The Horse Go To The Doctor?

Write the letter of each answer in the box containing the exercise number.

Find the *x*- and *y*-intercepts of the graph of the linear equation.

1. $3x + 4y = 24$
2. $-4x - 6y = 12$
3. $x + 9y = 36$
4. $-2x + 5y = -10$
5. $y = 3$
6. $7x - 2y = 28$
7. $-\frac{1}{4}x + 2y = 8$
8. $\frac{1}{6}x - \frac{1}{3}y = 9$
9. $x = -14$
10. $13x - 14y = -26$
11. The student council is responsible for setting up the tables for an awards banquet at the end of the year. The council members need to decide what tables they should use. Eight people can sit at a circular table, while 12 people can sit at a rectangular table. There are 144 people who confirmed that they would attend. The equation $8x + 12y = 144$ models this situation, where x is the number of circular tables and y is the number of rectangular tables. Find the x- and y-intercepts.

Answers

E. x-intercept: $(-3, 0)$; y-intercept: $(0, -2)$

R. x-intercept: $(-32, 0)$; y-intercept: $(0, 4)$

Y. x-intercept: $(4, 0)$; y-intercept: $(0, -14)$

O. x-intercept: $(36, 0)$; y-intercept: $(0, 4)$

F. x-intercept: $(-14, 0)$; y-intercept: none

A. x-intercept: $(5, 0)$; y-intercept: $(0, -2)$

V. x-intercept: $(-2, 0)$; y-intercept: $\left(0, \frac{13}{7}\right)$

R. x-intercept: none; y-intercept: $(0, 3)$

H. x-intercept: $(18, 0)$; y-intercept: $(0, 12)$

F. x-intercept: $(54, 0)$; y-intercept: $(0, -27)$

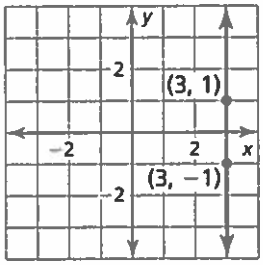
E. x-intercept: $(8, 0)$; y-intercept: $(0, 6)$

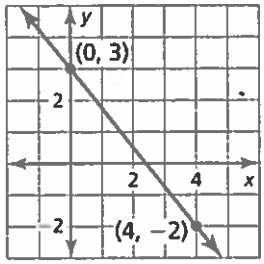
9	3	5		11	4	6		8	1	10	2	7

Name _____ Date _____

3.5 Practice B

In Exercises 1 and 2, describe the slope of the line. Then find the slope.

1. 

2. 

In Exercises 3 and 4, the points represented by the table lie on a line. Find the slope of the line.

3.

x	4	4	4	4
y	−2	1	4	7

4.

x	3	1	−1	−3
y	−4	1	6	11

In Exercises 5–8, find the slope and the *y*-intercept of the graph of the linear equation.

5. $y = 12$

6. $-3x + y = 7$

7. $-4x = 9 - 2y$

8. $0 = 2 - 3y + 12x$

In Exercises 9–12, graph the linear equation. Identify the *x*-intercept.

9. $y = x$

10. $x + 3y = 9$

11. $-y + 2x = 0$

12. $3x - y + 1 = 0$

13. A linear function g models the growth of your hair. On average, the length of a hair strand increases 1.25 centimeters every month.

    a. Graph g when $g(0) = 10$.

    b. Identify the slope and interpret the y-intercept of the graph.

    c. By how much, in inches, does the length of a hair strand increase each month?

In Exercises 14 and 15, find the value of *k* so that the graph of the equation has the given slope or *y*-intercept.

14. $y = 6kx - 2; m = \frac{2}{3}$

15. $y = -\frac{1}{2}x + \frac{4}{3}k; b = -8$