

## Study Guide and Review - Chapter 2

**Choose the correct term to complete each sentence.**

1. A function is (discrete, one-to-one) if each element of the domain is paired to exactly one unique element of the range.

**ANSWER:**

one-to-one

2. The (domain, range) of a relation is the set of all first coordinates from the ordered pairs which determine the relation.

**ANSWER:**

domain

3. The (constant, identity) function is a linear function described by  $f(x) = x$ .

**ANSWER:**

identity

4. If you are given the coordinates of two points on a line, you can use the (slope-intercept, point-slope) form to find the equation of the line that passes through them.

**ANSWER:**

point-slope

5. A set of bivariate data graphed as ordered pairs in a coordinate plane is called a (scatter plot, line of fit).

**ANSWER:**

scatter plot

6. A function that is written using two or more expressions is called a (linear, piecewise) function.

**ANSWER:**

piecewise

**State the domain and range of each relation. Then determine whether the relation is a function. If it is a function, determine if it is *one-to-one*, *onto*, *both*, or *neither*.**

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

**ANSWER:**

$$D = \{1, 3, 5, 7\}$$

$$R = \{2, 4, 6, 8\}$$

function; both

8.  $\{(-3, 0), (0, 2), (2, 4), (4, 5), (5, 2)\}$

**ANSWER:**

$$D = \{-3, 0, 2, 4, 5\}$$

$$R = \{0, 2, 4, 5\}$$

function; onto

9.  $\{(-4, 1), (3, 3), (1, 1), (-2, 5), (3, -4)\}$

**ANSWER:**

$$D = \{-4, -2, 1, 3, \}$$

$$R = \{-4, 1, 3, 5\}$$

not a function

10.  $\{(7, -4), (5, -2), (3, 0), (1, 2), (-1, 4)\}$

**ANSWER:**

$$D = \{-1, 1, 3, 5, 7\}$$

$$R = \{-4, -2, 0, 2, 4\}$$

function; both

**Find each value if  $f(x) = -3x + 2$ .**

11.  $f(4)$

**ANSWER:**

-10

12.  $f(-3)$

**ANSWER:**

11

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13.  $f(0)$

ANSWER:

2

14.  $f(y)$

ANSWER:

$-3y + 2$

15.  $f(-a)$

ANSWER:

$3a + 2$

16.  $f(2w)$

ANSWER:

$-6w + 2$

17. **BOWLING** A bowling alley charges \$2.50 for shoe rental and \$3.25 per game bowled. The amount a bowler is charged can be expressed as  $y = 2.50 + 3.25x$ , when  $x \geq 1$ , and is an integer. Find the domain and range. Then determine whether the equation is a function. Is the equation discrete or continuous?

ANSWER:

$D = \{1, 2, 3, 4, 5, \dots\}$

$R = \{5.75, 9, 12.25, 15.5, 18, 21.75, \dots\}$

function; discrete

**State whether each function is a linear function. Write yes or no. Explain.**

18.  $3x + 4y = 12$

ANSWER:

yes

19.  $x^2 + y^2 = 4$

ANSWER:

No; the variables have an exponent other than 1.

20.  $y = x^3 - 6$

ANSWER:

No;  $x^3$  has an exponent other than 1.

21.  $y = 6x - 19$

ANSWER:

yes

22.  $f(x) = -2x + 9$

ANSWER:

yes

23.  $\frac{1}{x} + 3y = -5$

ANSWER:

No;  $x$  appears in a denominator.

**Write each equation in standard form. Identify A, B, and C.**

24.  $2x + 5y = 10$

ANSWER:

$2, 5, 10$

25.  $y = 12x$

ANSWER:

$12x - y = 0; 12, -1, 0$

26.  $-4y = 3x - 24$

ANSWER:

$3x + 4y = 24; 3, 4, 24$

27.  $4x = 8y - 12$

ANSWER:

$x - 2y = -3; 1, -2, -3$

28. **TRAVEL** The distance the Green family traveled during their family vacation is given by the equation  $y = 65x$ , where  $x$  represents the number of hours spent driving. How far does the Green family travel in 8 hours?

ANSWER:

520 miles

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29. **RETAIL** The table shows the number of DVDs sold each week at the Super Movie store. Find the average rate of change of the number of DVDs sold from week 2 to week 5.

Week	1	2	3	4	5
DVDs Sold	76	58	94	83	112

**ANSWER:**

18

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

30. (2, 5), (6, -3)

**ANSWER:**

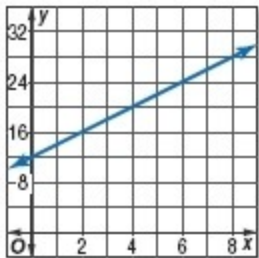
-2

31. (8, 2), (2, 8)

**ANSWER:**

-1

32. Determine the rate of change of the graph.



**ANSWER:**

2

**Write an equation in slope-intercept form for the line that satisfies each set of conditions.**

33. slope -2, passes through (-3, -5)

**ANSWER:**

$$y = -2x - 11$$

34. slope  $\frac{2}{3}$ , passes through (4, -1)

**ANSWER:**

$$y = \frac{2}{3}x - \frac{11}{3}$$

35. passes through (-2, 4) and (0, 8)

**ANSWER:**

$$y = 2x + 8$$

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

**ANSWER:**

$$y = 5$$

**Write an equation of the line passing through each pair of points.**

37. (6, 1), (4, 9)

**ANSWER:**

$$y = -4x + 25$$

38. (-4, 2), (6, 8)

**ANSWER:**

$$y = \frac{3}{5}x + \frac{22}{5}$$

**Write an equation in slope-intercept form for the line that satisfies each set of conditions.**

39. through (1, 2), parallel to  $y = 4x - 3$

**ANSWER:**

$$y = 4x - 2$$

40. through (-3, 5), perpendicular to  $y = \frac{2}{3}x - 8$

**ANSWER:**

$$y = -\frac{3}{2}x + \frac{1}{2}$$

41. **PETS** Drew paid a \$250 fee when he adopted a puppy. The average monthly cost of feeding and caring for the puppy is \$32. Write an equation that represents the total cost of adopting and caring for the puppy for  $x$  months.

**ANSWER:**

$$y = 32x + 250$$

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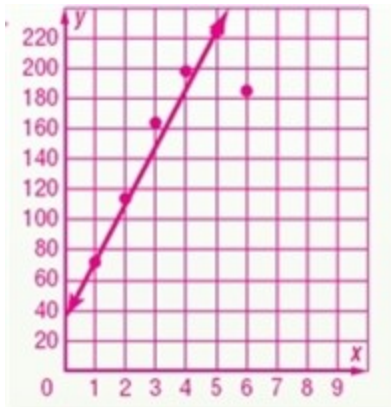
Make a scatter plot and a line of fit and describe the correlation for each set of data. Then, use two ordered pairs to write a prediction equation.

42. **HEATING** The table shows the monthly heating cost for a large home.

Month	Sep	Oct	Nov	Dec	Jan	Feb
Bill (\$)	72	114	164	198	224	185

ANSWER:

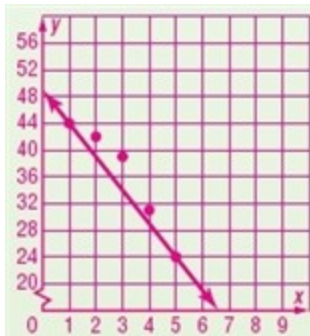
Sample answer: using (1, 72) and (5, 224):  $y = 38x + 34$



43. **AMUSEMENT PARK** The table shows the annual attendance in thousands at an amusement park during the last 5 years.

Year	1	2	3	4	5
People ( $\times 1000$ )	44	42	39	31	24

ANSWER:

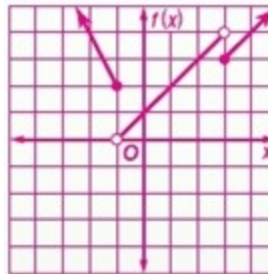


Sample Answer using (1, 44) and (5, 24)  
 $y = -5x + 49$

Graph each function. Identify the domain and range.

$$44. f(x) = \begin{cases} -2x & \text{if } x \leq -1 \\ x+1 & \text{if } -1 < x < 3 \\ x & \text{if } x \geq 3 \end{cases}$$

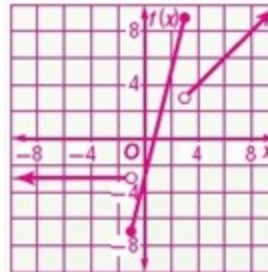
ANSWER:



$$D = \{\text{all real numbers}\}; R = \{f(x) \mid f(x) > 0\}$$

$$45. f(x) = \begin{cases} -3 & \text{if } x < -1 \\ 4x-3 & \text{if } -1 \leq x \leq 3 \\ x & \text{if } x > 3 \end{cases}$$

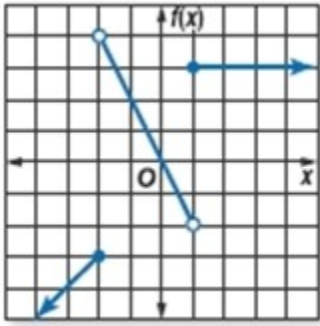
ANSWER:



$$D = \{\text{all real numbers}\}; R = \{f(x) \mid f(x) \geq -7\}$$

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46. Write the piecewise function shown in the graph.



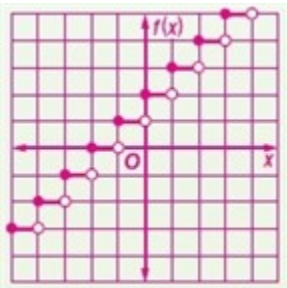
ANSWER:

$$f(x) = \begin{cases} x-1 & \text{if } x \leq -2 \\ -2x & \text{if } -2 < x < 1 \\ x & \text{if } x \geq 1 \end{cases}$$

Graph each function. Identify the domain and range.

47.  $f(x) = \lceil x \rceil + 2$

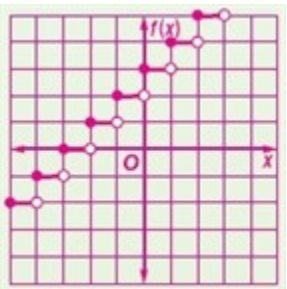
ANSWER:



D = {all real numbers}; R = {all integers}

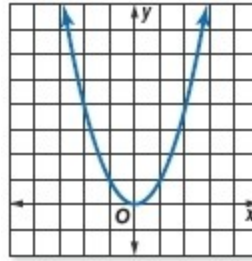
48.  $f(x) = \lfloor x + 3 \rfloor$

ANSWER:



D = {all real numbers}; R = {all integers}

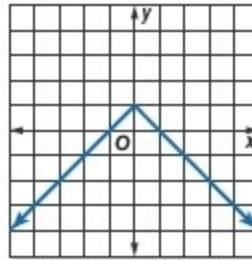
Identify the type of function represented by each graph.



49.

ANSWER:

quadratic



50.

ANSWER:

absolute value

51. Describe the translation in  $y = x^2 - 3$ .

ANSWER:

$y = x^2$  shifted down 3 units

52. Describe the reflection in  $y = -x^2$ .

ANSWER:

$y = x^2$  reflected over the  $x$ -axis

53. **CONSTRUCTION** A large arch is being constructed at the entrance of a new city hall building. The shape of the arch resembles the graph of the function  $f(x) = -0.025x^2 + 3.64x - 0.038$ . Describe the shape of the arch.

ANSWER:

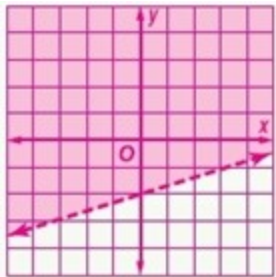
parabola

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Graph each inequality.

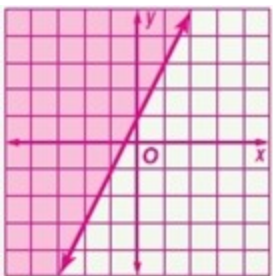
54.  $x - 3y < 6$

ANSWER:



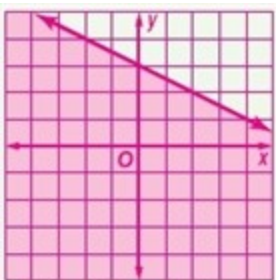
55.  $y \geq 2x + 1$

ANSWER:



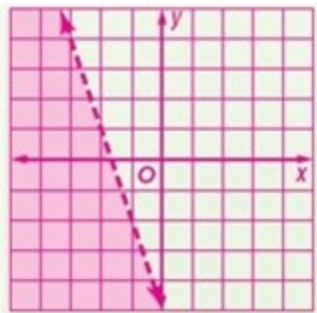
56.  $2x + 4y \leq 12$

ANSWER:



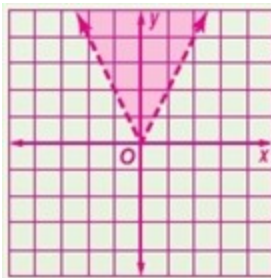
57.  $y < -3x - 5$

ANSWER:



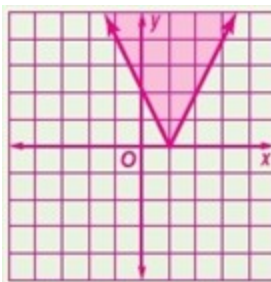
58.  $y > |2x|$

ANSWER:



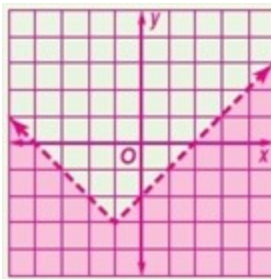
59.  $y \geq |2x - 2|$

ANSWER:



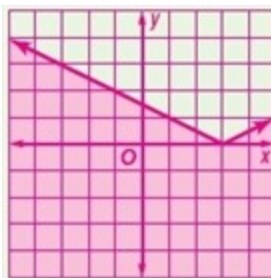
60.  $y + 3 < |x + 1|$

ANSWER:



61.  $2y \leq |x - 3|$

ANSWER:



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62. **BOOKS** Spencer has saved \$96 for a trip to his favorite bookstore. Each paperback book costs \$8 and each hardback book costs \$12. Write and graph an inequality that shows the number of paperback books and hardback books Spencer can purchase.

**ANSWER:**

$$8x + 12y \leq 96$$

