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*.

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

SOLUTION:

The domain is the set of *x*-coordinates.

 $D = \{ -4, -2, 1, 3, \}$ The range is the set of *y*-coordinates. $R = \{ -4, 1, 3, 5 \}$

Since 3 is paired with -4 and 3, the relation is not a function.

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

12.f(-3)

SOLUTION: f(x) = -3x + 2 f(-3) = -3(-3) + 2 = 9 + 2= 11

15.f(-a)

SOLUTION:

f(x) = -3x + 2f(-a) = -3(-a) + 2= 3a + 2 State whether each function is a linear function. Write *yes* or *no*. Explain.

18.
$$3x + 4y = 12$$

SOLUTION:

$$3x + 4y = 12$$

$$3x + 4y - 3x = -3x + 12$$

$$4y = -3x + 12$$

$$\frac{4y}{4} = \frac{-3x + 12}{4}$$

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

Since it can be written in the form f(x) = mx + b, the function is linear.

21. y = 6x - 19
SOLUTION: Since y = 6x - 19 is of the form f(x) = mx + b, the function is linear.
Write each equation in standard form. Identify A, B, and C.
24. 2x + 5y = 10

SOLUTION: Compare the equation 2x + 5y = 10 with Ax + By = C. So, A = 2, B = 5 and C = 10. 27. 4x = 8y - 12SOLUTION: 4x = 8y - 12 4x - 8y = -12 4(x - 2y) = -12 x - 2y = -3Compare the equation x - 2y = -3 with Ax + By = C. So, A = 1, B = -2 and C = -3.

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

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

SOLUTION:

 $m = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{-3 - 5}{6 - 2}$ $= \frac{-8}{4}$ = -2

The slope of the line that passes through (2, 5) and (6, -3) is -2.

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

33. slope -2, passes through (-3, -5) **SOLUTION:** Substitute m = -2 and $(x_1, y_1) = (-3, -5)$ in the equation $y - y_1 = m(x - x_1)$. $y - y_1 = m(x - x_1)$ y - (-5) = -2(x - (-3)) y + 5 = -2(x + 3) y + 5 = -2x - 6 y + 5 - 5 = -2x - 6 - 5y = -2x - 11

So, the equation in slope-intercept form is y = -2x - 11.

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

SOLUTION:

Find the slope of the line.

 $m = \frac{y_2 - y_1}{x_2 - x_1}$ = $\frac{5 - 5}{-1 - 3}$ = $\frac{0}{-4}$ = 0Substitute m = 0 and $(x_1, y_1) = (3, 5)$ in the equation $y - y_1 = m(x - x_1)$. $y - y_1 = m(x - x_1)$ y - 5 = 0(x - 3)y - 5 = 0(x - 3)y - 5 = 0y - 5 + 5 = 0 + 5y = 5

So, the equation of the line passes through (3, 5) and (-1, 5) is y = 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

SOLUTION:

Since the required line is parallel to y = 4x - 3, the slope of the line is the same as the slope of the line y = 4x - 3. So the slope of the line is m = 4. Substitute m = 4 and (x, y) = (1, 2) in the slope-intercept form y = mx + b. 2 = 4(1) + b2 = 4 + b2 - 4 = b-2 = bSubstitute m = 4 and b = -2 in the slope-intercept form y = mx + b. y = 4x - 2

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.

Study Guide and Review - Chapter 2

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

SOLUTION:

Draw a scatter plot.



Use the ordered pairs (1, 72) and (5, 224).

 $m = \frac{y_2 - y_1}{x_2 - x_1}$ = $\frac{224 - 72}{5 - 1}$ = $\frac{152}{4}$ = 38 Substitute m = 38 and (x, y) = (1, 72) in the slope-intercept form y = mx + b. 72 = 38(1) + b72 = 38 + b72 - 38 = b34 = bSubstitute m = 38 and b = 34 in the slope-intercept form y = mx + b. So, a prediction equation is y = 38x + 34. Graph each function. Identify the domain and range.

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

SOLUTION:

			0	16	dp.			1
			0				/	
			4			\sim		
			-	4	đ			
_				L				
-8		4	0		4		1	3 X
-			2					
	-		1					
			-8-					
D =	{al	l r	ea	l n	un	nb	er	s};
R =	{f	(x) <i>f</i>	(x)≥	2 -	7	1

Graph each function. Identify the domain and range.

48.
$$f(x) = [x+3]$$

SOLUTION:



Study Guide and Review - Chapter 2

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

SOLUTION:

The graph $y = x^2$ is shifted down 3 units to get the graph of $y = x^2 - 3$.

Graph each inequality.

54. x - 3y < 6

SOLUTION:

Graph the inequality x - 3y < 6.



57. y < -3x - 5

SOLUTION:

Graph the inequality y < -3x - 5.



60. y + 3 < |x + 1|

SOLUTION:

Graph the inequality y + 3 < |x + 1|.

				y				
								1
							1	
×						1		
	1		0		1			X
	~		0	1	1			X
	~	1	0	/	1			X
			0	/	1			X