Name _____ Date _____ Class _____

LESSON 12-4

Problem Solving

Point-Slope Form

Write the correct answer.

1. A 1600 square foot home in Houston will sell for about $102,000. The price increases about $43.41 per square foot. Write an equation that describes the price y of a house in Houston, based on the square footage x.

_____

2. Write the equation in Exercise 1 in slope-intercept form.

_____

3. Wind chill is a measure of what temperature feels like with the wind. With a 25 mph wind, 40°F will feel like 29°F. Write an equation in point-slope form that describes the wind chill y based on the temperature x, if the slope of the line is 1.337.

_____

4. With a 25 mph wind, what does a temperature of 0°F feel like?

_____

From 2 to 13 years, the growth rate for children is generally linear. Choose the letter of the correct answer.

5. The average height of a 2-year old boy is 36 inches, and the average growth rate per year is 2.2 inches. Write an equation in point-slope form that describes the height of a boy y based on his age x.

A $y - 36 = 2(x - 2.2)$

B $y - 2 = 2.2(x - 36)$

C $y - 36 = 2.2(x - 2)$

D $y - 2.2 = 2(x - 36)$

6. The average height of a 5-year old girl is 44 inches, and the average growth rate per year is 2.4 inches. Write an equation in point-slope form that describes the height of a girl y based on her age x.

F $y - 2.4 = 44(x - 5)$

G $y - 44 = 2.4(x - 5)$

H $y - 44 = 5(x - 2.4)$

J $y - 5 = 2.4(x - 44)$

7. Write the equation from Exercise 6 in slope-intercept form.

A $y = 2.4x - 100.6$

B $y = 44x - 217.6$

C $y = 5x + 32$

D $y = 2.4x + 32$

8. Use the equation in Exercise 6 to find the average height of a 13-year old girl.

F 56.3 in.

G 63.2 in.

H 69.4 in.

J 97 in.

LESSON 12-4

Problem Solving

Point-Slope Form

Write the correct answer.

1. A 1600 square foot home in Houston will sell for about $102,000. The price increases about $43.41 per square foot. Write an equation that describes the price y of a house in Houston, based on the square footage x.

   $y - 102{,}000 = 43.41(x - 1600)$

2. Write the equation in Exercise 1 in slope-intercept form.

   $y = 43.41x + 32{,}544$

3. Wind chill is a measure of what temperature feels like with the wind. With a 25 mph wind, 40°F will feel like 29°F. Write an equation in point-slope form that describes the wind chill y based on the temperature x, if the slope of the line is 1.337.

   $y - 29 = 1.337(x - 40)$

4. With a 25 mph wind, what does a temperature of 0°F feel like?

   −24.48°F

From 2 to 13 years, the growth rate for children is generally linear. Choose the letter of the correct answer.

5. The average height of a 2-year old boy is 36 inches, and the average growth rate per year is 2.2 inches. Write an equation in point-slope form that describes the height of a boy y based on his age x.
   - **A** $y - 36 = 2(x - 2.2)$
   - **B** $y - 2 = 2.2(x - 36)$
   - **C** $y - 36 = 2.2(x - 2)$
   - **D** $y - 2.2 = 2(x - 36)$

6. The average height of a 5-year old girl is 44 inches, and the average growth rate per year is 2.4 inches. Write an equation in point-slope form that describes the height of a girl y based on her age x.
   - **F** $y - 2.4 = 44(x - 5)$
   - **G** $y - 44 = 2.4(x - 5)$
   - **H** $y - 44 = 5(x - 2.4)$
   - **J** $y - 5 = 2.4(x - 44)$

7. Write the equation from Exercise 6 in slope-intercept form.
   - **A** $y = 2.4x - 100.6$
   - **B** $y = 44x - 217.6$
   - **C** $y = 5x + 32$
   - **D** $y = 2.4x + 32$

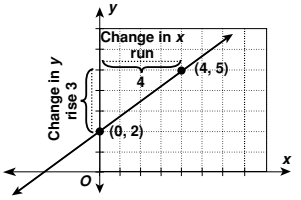
8. Use the equation in Exercise 6 to find the average height of a 13-year old girl.
   - **F** 56.3 in.
   - **G** 63.2 in.
   - **H** 69.4 in.
   - **J** 97 in.

LESSON 12-4

Reading Strategies

Use a Procedure

To find the slope of a line, you can use the coordinates for two points on the line.



Step 1: Subtract to find the difference between the y-coordinates of the two points: $5 - 2 = 3$.

Step 2: Subtract to find the difference between the x-coordinates of the two points: $4 - 0 = 4$.

Step 3: Write the ratio of the differences. The difference between the y-coordinates is 3. The difference between the x-coordinates is 4. The slope is the ratio $\frac{3}{4}$.

When you have the slope of a line and a point it passes through, you can write an equation for the line in **point-slope form.**

Point on the line	Slope	Point-slope form
(x_1, y_1)	m	$y - y_1 = m(x - x_1)$
(4, 5)	$\frac{3}{4}$	$y - 5 = \frac{3}{4}(x - 4)$

Use the above example to answer each question.

1. What ratio is shown by the slope of a line?

   $\frac{\text{change in } y}{\text{change in } x}$, or $\frac{\text{rise}}{\text{run}}$

2. How can you find the slope of a line?

   Possible answer: Find the difference between the y-values of two points and find the difference between the x-values of the same points; write the differences as a ratio.

3. What information do you need to write an equation for a line in point-slope form?

   coordinates of a point the line passes through and slope of the line

LESSON 12-4

Puzzles, Twisters & Teasers

Get a Clue!

Identify a point on each line and the slope of the line. Then use the slope values to answer the riddle.

1. $y + 1 = \frac{2}{3}(x + 7)$	point = $-7, -1$	slope = $\frac{2}{3}$	S
2. $y + 1 = 11(x - 1)$	point = $1, -1$	slope = 11	C
3. $y - 2 = -\frac{1}{6}(x - 11)$	point = $11, 2$	slope = $-\frac{1}{6}$	N
4. $y + 7 = 1(x - 5)$	point = $5, -7$	slope = 1	L
5. $y + 7 = 3(x + 4)$	point = $-4, -7$	slope = 3	E
6. $y - 9 = 5(x - 12)$	point = $12, 9$	slope = 5	B
7. $y - 11 = 14(x - 8)$	point = $8, 11$	slope = 14	H
8. $y - 4 = -2(x + 7)$	point = $-7, 4$	slope = -2	O
9. $y - 3 = -1.8(x - 5.6)$	point = $5.6, 3$	slope = -1.8	R
10. $y + 8 = -6(x - 9)$	point = $9, -8$	slope = -6	K

What do you call a dog detective?

S	H	E	R	L	O	C	K
$\frac{2}{3}$	14	3	−1.8	1	−2	11	−6

B	O	N	E	S
5	−2	$-\frac{1}{6}$	3	$\frac{2}{3}$

LESSON 12-5

Practice A

Direct Variation

The following tables show direct variation for the given equation. Complete the missing information in the tables.

1. $y = 2x$

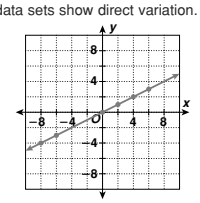
x	−10	−7	−4	3	6	12	15	22
y	−20	−14	−8	6	12	24	30	44

2. $y = \frac{1}{3}x$

x	−21	−15	−9	3	8	12	19	30
y	−7	−5	−3	1	$2\frac{2}{3}$	4	$6\frac{1}{3}$	10

3. Make a graph to determine whether the data sets show direct variation.

x	y
−8	−4
−6	−3
0	0
2	1
4	2
6	3



The data sets show direct variation.

Find each equation of direct variation, given that y varies directly with x.

4. y is 10 when x is 2.

   $y = 5x$

5. y is 42 when x is −6.

   $y = -7x$

6. y is −50 when x is 5.

   $y = -10x$

7. y is 15 when x is 30.

   $y = \frac{1}{2}x$

8. At a constant speed, the gasoline a car uses varies directly with the distance the car travels. A car uses 10 gallons of gasoline to travel 210 miles. How many gallons will the car use to travel 294 miles? 14 gallons