Lesson 9.1   Skills Practice

NAME_____ DATE _____

Call to Order
Inequalities

Vocabulary

Write the term that best completes each statement.

1. A(n) _____ in one variable is the set of all points on a number line that makes the inequality true.

2. A(n) _____ begins at a starting point and goes on forever in one direction.

3. Any mathematical sentence that has an inequality symbol is a(n) _____.

4. The _____ is the set of all numbers that make the inequality true.

Problem Set

Write the corresponding inequality for each statement.

1. 12 is greater than 5

   $12 > 5$

2. 6 is less than or equal to 8

3. 10 is greater than or equal to 3

4. $4\frac{1}{3}$ is less than $4\frac{3}{4}$

5. 93.2 is greater than 91.7

6. $\frac{3}{8}$ is less than or equal to $\frac{3}{8}$

Write the meaning of the inequality in words.

7. $14 \geq 13$

8. $46.2 < 56.2$

Fourteen is greater than or equal to thirteen.

9. $\frac{1}{8} \leq \frac{1}{5}$

10. $100.9 > 100.1$

11. $6\frac{3}{4} < 8\frac{1}{4}$

12. $17.1 \geq 17.1$

Write $<$ or $>$ to make the inequality true.

13. $5 \boxed{<} 8$

14. $\frac{3}{4} \square \frac{3}{8}$

15. $7.35 \square 7.32$

16. $12.1 \square 12\frac{1}{5}$

17. $12.05 \square 12.051$

18. $2\frac{4}{5} \square 2.75$

Write $\leq$ or $\geq$ to make the inequality true.

19. $47 \boxed{\geq} 43$

20. $9.09 \square 9.1$
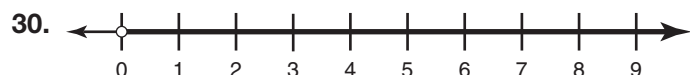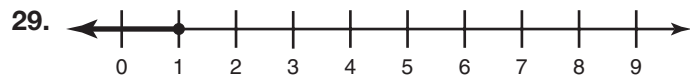
21. $5\frac{1}{4} \square 5\frac{1}{3}$
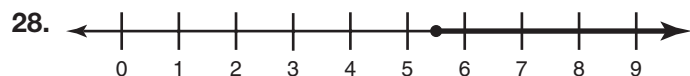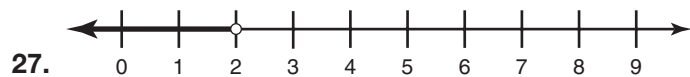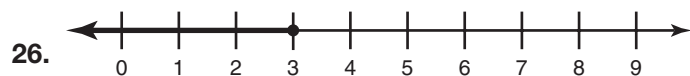
22. $\frac{3}{4} \square \frac{5}{8}$

23. $1\frac{4}{5} \square 1.75$

24. $2.22 \square 2.222$

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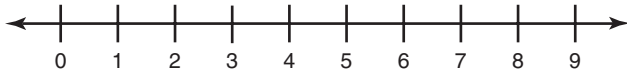Write the inequality represented by the given graph.

25.

x > 7

26.

27.

28.

29.

30.

9

Graph the solution set for each given inequality.

31. $x < 6$
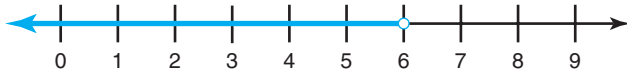
32. $x \geq 7.5$

33. $3\dfrac{1}{2} \geq x$

34. $x > 8.25$

35. $1.8 \leq x$

36. $x < 9$

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Opposites Attract to Maintain a Balance
Solving One-Step Equations Using Addition and Subtraction

Vocabulary

Write a definition for each of the following terms in your own words.

1. one-step equation

2. solution

3. Property of Equality for Addition

4. Property of Equality for Subtraction

5. inverse operations

Problem Set

Determine what will balance 1 rectangle in each. Describe your strategies.

1.

2.
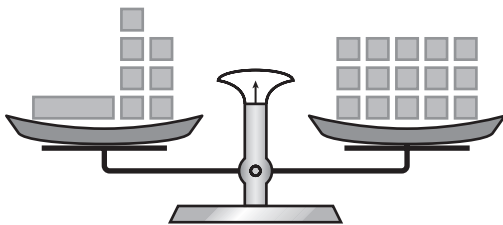
Eight squares will balance 1 rectangle.
I subtracted 7 squares from each side.

9
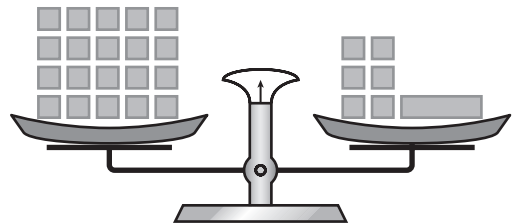
3.
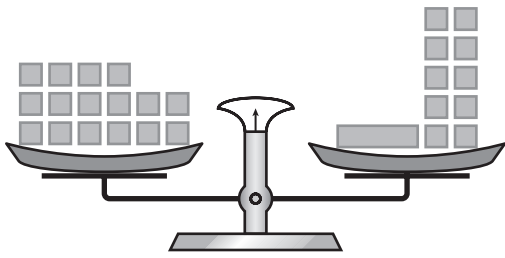
4.
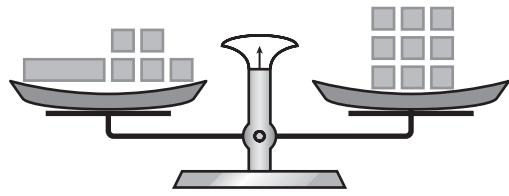
5.
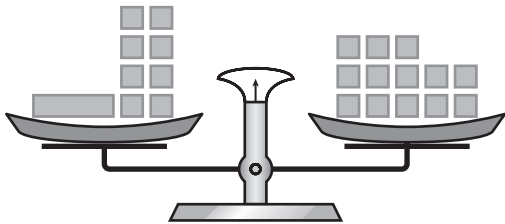
6.
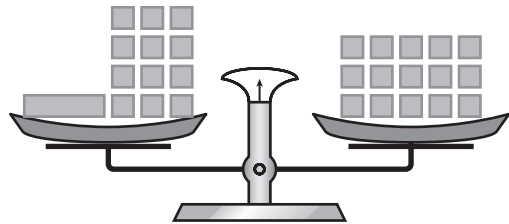
7.
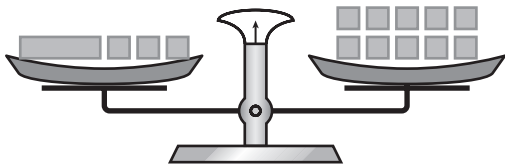
8.
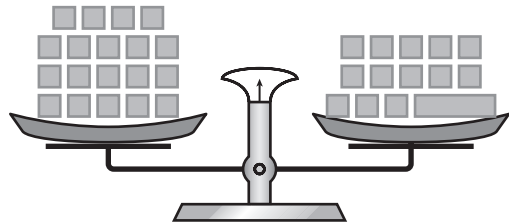
NAME_____ DATE _____

Write an equation that represents each pan balance. Then, solve the equation and check your solution.

9.
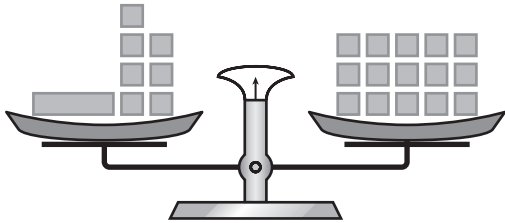
$$x + 7 = 15$$
$$x + 7 - 7 = 15 - 7$$
$$x = 8$$

Check:
$$8 + 7 = 15$$
$$15 = 15$$

10.

9

11.

12.

13.

14.

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State the inverse operation needed to isolate the variable. Then, solve the equation and check your solution.

9

15. $d + 6 = 13$

Subtract 6 from each side.

$d + 6 = 13$ Check:
$d + 6 - 6 = 13 - 6$ $7 + 6 = 13$
$d = 7$ $13 = 13$

16. $35 = t - 12$

17. $x - 14 = 7$

18. $x + 20 = 41$

19. $29 = 17 + m$

20. $c - 9 = 23$

21. $33 + p = 33$

22. $31 = f - 19$

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Determine if each solution is true. Explain your reasoning.

23. Is $x = 17$ a solution to the equation $x + 15 = 42$?

$17 + 15 \overset{?}{=} 42$

$32 \neq 42$

The value $x = 17$ is not a solution to the equation $x + 15 = 42$.

24. Is $s = 7$ a solution to the equation $19 = 23 - s$?

25. Is $c = 71$ a solution to the equation $56 = c - 15$?

26. Is $x = 28$ a solution to the equation $x + 42 = 70$?

27. Is $m = 83$ a solution to the equation $m - 32 = 49$?

28. Is $t = 44$ a solution to the equation $28 + t = 72$?

9

29. Is $k = 49$ a solution to the equation $88 - k = 39$?

30. Is $z = 13$ a solution to the equation $57 = 34 + z$?

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Statements of Equality Redux
Solving One-Step Equations with Multiplication and Division

Vocabulary

1. State the Multiplication Property of Equality.

2. State the Division Property of Equality.

Problem Set

Determine what will balance 1 rectangle in each. Describe your strategies.

1.
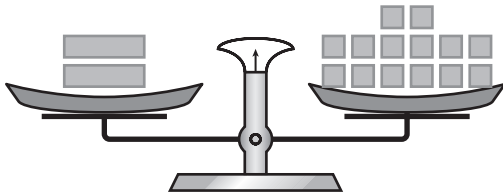
Seven squares will balance 1 rectangle.
I divided the 14 squares into 2 groups.

2.
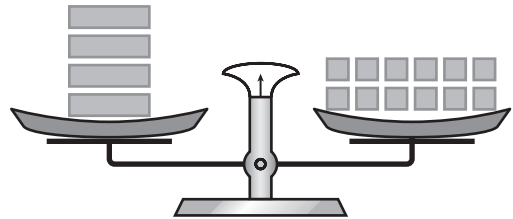
3.
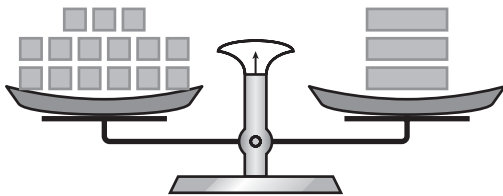
4.
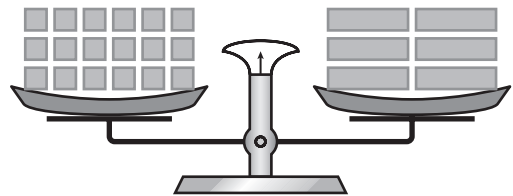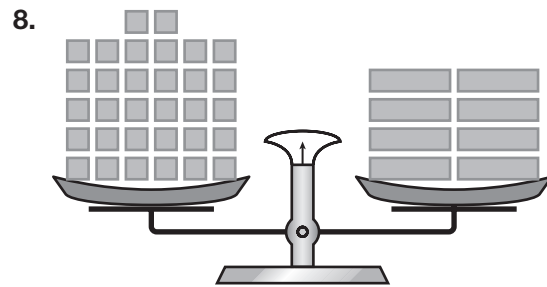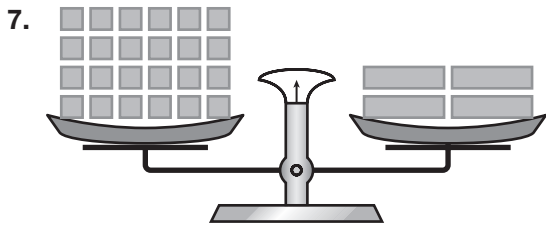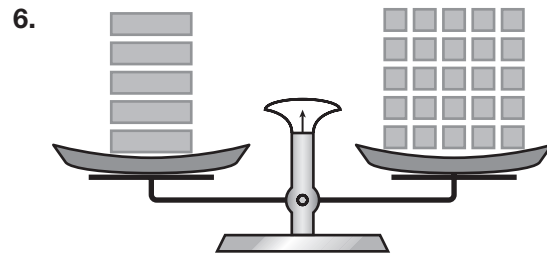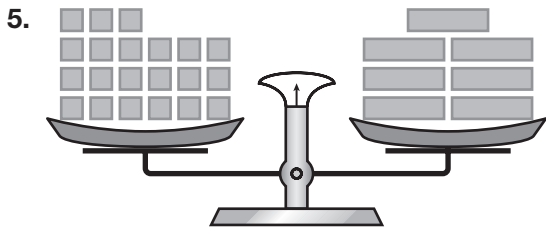
5.

6.

7.

8.

Write an equation that represents each pan balance. Then, solve the equation and check your solution.

9.

$2x = 14$

$\dfrac{2x}{2} = \dfrac{14}{2}$

$x = 7$

Check:

$2 \cdot 7 = 14$
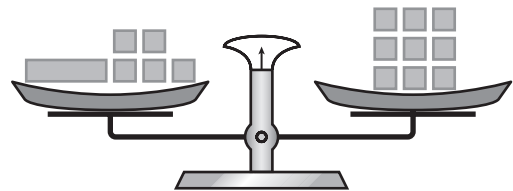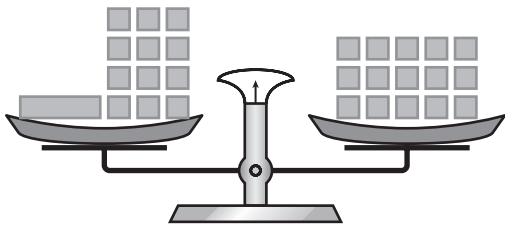
$14 = 14$

10.

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11.

12.

9

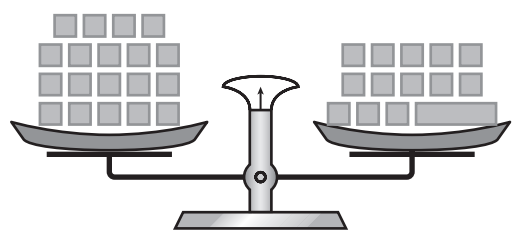**13.**

14.
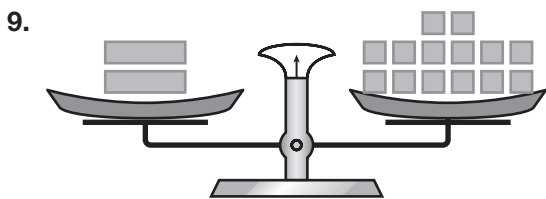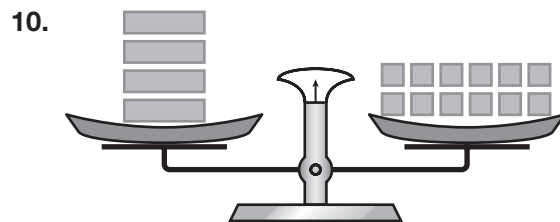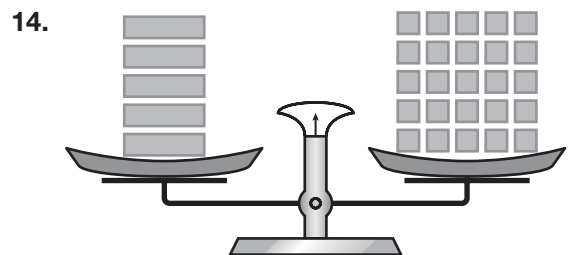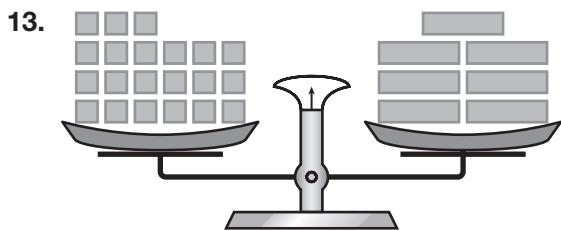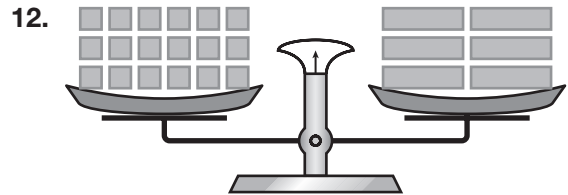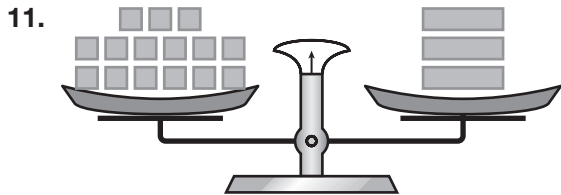
State the inverse operation needed to isolate the variable. Then, solve the equation and check your solution.

15. $\dfrac{x}{4} = 12$

Multiply each side by 4.

$$\dfrac{x}{4} = 12 \qquad \text{Check:}$$
$$4\left(\dfrac{x}{4}\right) = 4(12) \qquad \dfrac{48}{4} = 12$$
$$x = 48 \qquad 12 = 12$$

16. $54 = 9p$

9

17. $13 = \dfrac{t}{7}$ **18.** $\dfrac{m}{5} = 11$

19. $8.5x = 51$ **20.** $6y = 42$

21. $18 = \dfrac{r}{3}$ **22.** $144 = 12x$

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Determine if each solution is true. Explain your reasoning.

23. Is $g = 20$ a solution to the equation $10g = 2000$?

$10 \cdot 20 \overset{?}{=} 2000$

$200 \neq 2000$

The value $g = 20$ is not a solution to $10g = 2000$.

24. Is $t = 7$ a solution to the equation $64 = 9t$?

25. Is $n = 78$ a solution to the equation $\dfrac{n}{6} = 13$?

26. Is $x = 140$ a solution to the equation $26 = \dfrac{x}{5}$?

9

27. Is $y = 19$ a solution to the equation $2y = 38$?

28. Is $q = 5$ a solution to the equation $13 = \dfrac{52}{q}$?

29. Is $m = 8$ a solution to the equation $189 = 21m$?

30. Is $x = 252$ a solution to the equation $\dfrac{x}{14} = 18$?

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There Are Many Ways. . .
Representing Situations in Multiple Ways

Problem Set

Define the variables in each given problem. Then, write an equation that models the problem situation.

1. A builder requires a certain number of bricks each time he builds a brick house. To make sure he has enough bricks, he always orders 50 additional bricks to account for any bricks that are broken during the construction.

   Define variables for the number of bricks required for a house and the number of bricks ordered. Write an equation that models the relationship between these variables.

   Let r represent the number of bricks required for a house and let b represent the number of bricks ordered.

   $b = r + 50$

2. On Patricia's dairy farm, her cows produce an average of 3.8 gallons of milk per minute during milking time.

   Define variables for the number of gallons of milk produced and the number of minutes spent milking. Write an equation that models the relationship between these variables.

3. Zack and Malachi have a lemonade stand. They make a profit of $2.50 for each gallon of lemonade sold.

   Define variables for the total profit Zack and Malachi make from their lemonade stand and the number of gallons sold. Write an equation that models the relationship between these variables.

9

4. In the Kentucky Derby, the total weight of each jockey and their gear must be exactly 126 pounds.

   Define variables for the weight of a jockey and the weight of the jockey's gear. Write an equation that models the relationship between these variables.

5. A department store adds a $4.99 processing fee to the cost of any merchandise purchased through their website.

   Define variables for the total cost of an order and the cost of the merchandise ordered. Write an equation that models the relationship between these variables.

6. An aluminum baseball bat factory produces 900 aluminum bats for every ton of aluminum they use.

   Define variables for the number of aluminum bats produced and the number of tons of aluminum used. Write an equation that models the relationship between these variables.

Use the given equation to complete each table.

7. $y = x + 27$

x	y
10	37
23	50
37	64
52	79
101	128

8. $m = 25t$

t	m
3	75
8	
	325
20	
	625

9. $7.25 + w = z$

w	z
2	
	13.25
	17.75
16.30	
	30

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10. $3.4x = y$

x	y
3	
	17
10	
	51
22	

11. $k = g + 22.3$

g	k
5	
	34.30
	44.60
30.90	
	69.10

12. $w = 11.1m$

m	w
2	
	88.80
12	
22	244.20

Use the given table of values to complete each graph.

13.

x	y
6	15
10	25
15	37.50
20	50
24	60
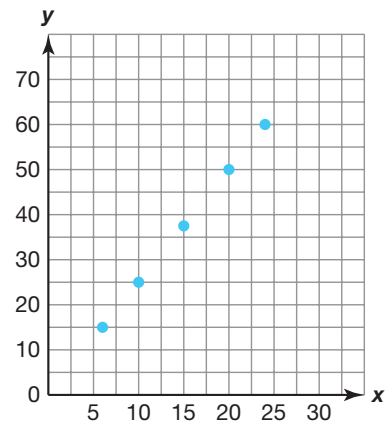
14.

j	k
1.20	3.70
3	5.50
4.50	7
7	9.50
9.10	11.60
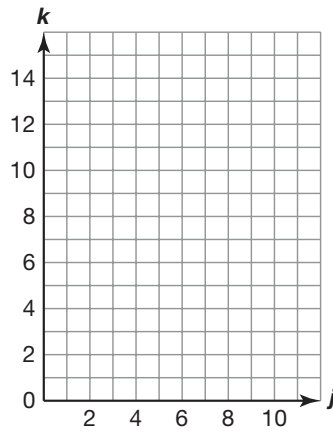
15.

m	w
10	2
15	3
22	4.40
35	7
44	8.80
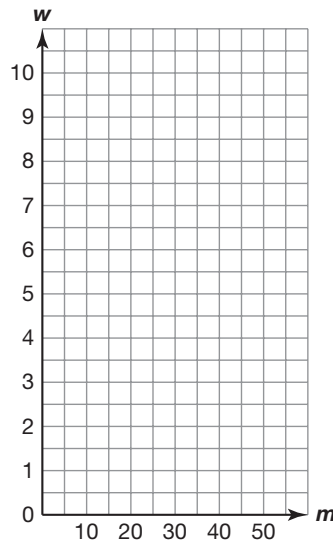
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16.

x	z
2	10
7	15
13	21
20	28
22	30
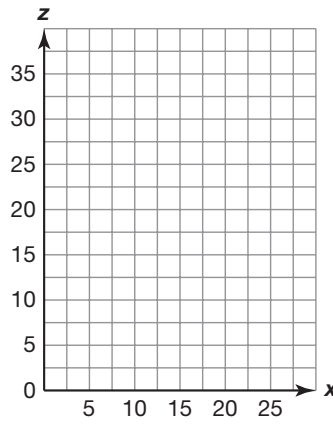
17.

g	h
3	45
5	75
7	105
10	150
15	225
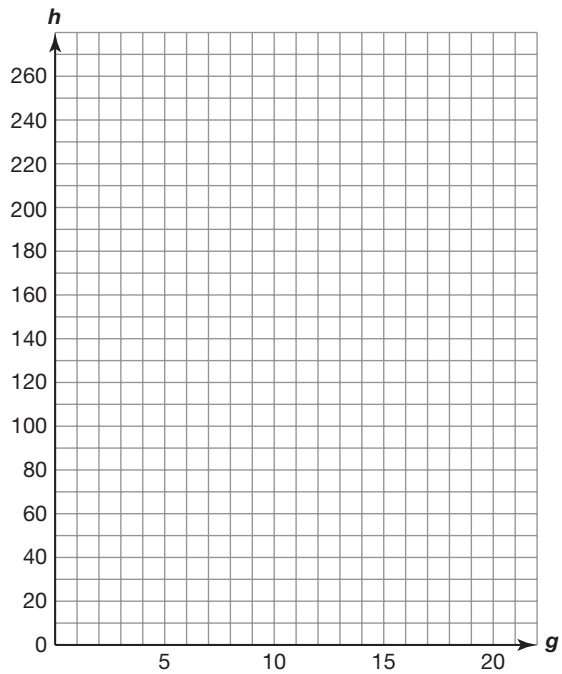
18.

x	y
1.50	30
4	80
5	100
7	140
9	180
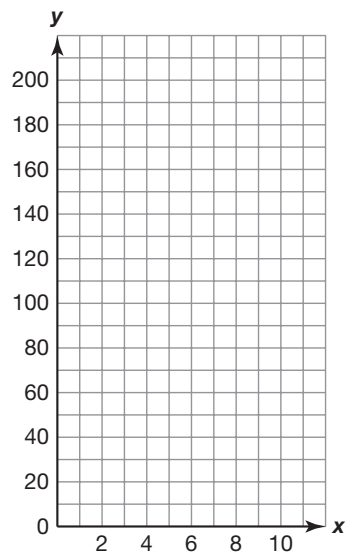
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Measuring Short
Using Multiple Representations to Solve Problems

Problem Set

9

Define the variables in each given problem. Then, write an equation that models the problem situation.

1. A store offers customers a $9.99 discount off of every pair of shoes purchased.

Define variables for the original price of a pair of shoes and the price of the shoes after the discount. Write an equation that models the relationship between these variables.

Let p represent the original price of a pair of shoes (in dollars) and let d represent the price of the shoes (in dollars) after the discount.

$d = p - 9.99$

2. The three owners of a construction company divide the total profit they make on the construction of any new home three ways.

Define variables for the total profit made on the construction of a new home and the profit made by each individual. Write an equation that models the relationship between these variables.

3. A business subtracts $7.50 from each employee's gross weekly pay to cover the cost of their uniforms.

Define variables for an employee's gross weekly pay and for an employee's weekly pay after the deduction for the cost of their uniform. Write an equation that models the relationship between these variables.

4. Five employees work on the receiving dock at a factory. They divide the number of crates they unload from each truck equally.

Define variables for the number of crates on a truck and for the number of crates each employee unloads from the truck. Write an equation that models the relationship between these variables.

5. On a windy January day, a weatherman in Montana subtracts 10 degrees from the actual air temperature (in degrees Fahrenheit) to determine the wind chill temperature at any given time.

Define variables for the actual air temperature and the wind chill temperature. Write an equation that models the relationship between these variables.

6. Old MacDonald feeds grain to his 75 cows each day. He wants to determine the average amount of grain (in pounds) consumed by each cow daily.

Define variables for the number of pounds of grain Old MacDonald feeds his cows on a given day and the average number of pounds consumed by each cow daily. Write an equation that models the relationship between these variables.

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Use the given equation to complete each table.

7. $y = x - 19$

x	y
30	11
53	34
64	45
79	60
103	84

8. $m = \dfrac{t}{8}$

t	m
16	
40	
	7
88	
	12.50

9. $w - 33.5 = z$

w	z
33.50	
	11.50
	17
72	
	66.50

10. $\dfrac{x}{5.5} = y$

x	y
22	
	5
55	10
	13
90.75	

11. $k = g - 105.2$

g	k
120	
	45.40
	100
245.3	
	194.80

12. $w = \dfrac{m}{9.2}$

m	w
27.6	
	5
74.52	
92	
	14

Use the given table of values to complete each graph.

13.

x	y
24	6
36	9
44	11
72	18
88	22
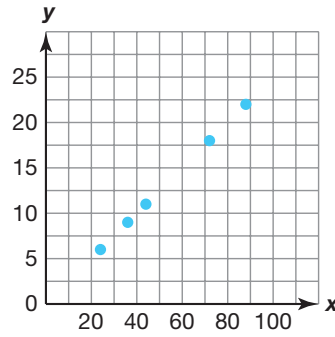
14.

j	k
15	5
25	15
40	30
55	45
75	65
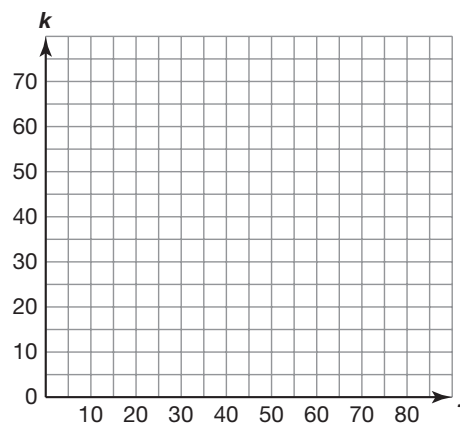
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15.

m	w
10	4
15	6
22.50	9
30	12
42.50	17
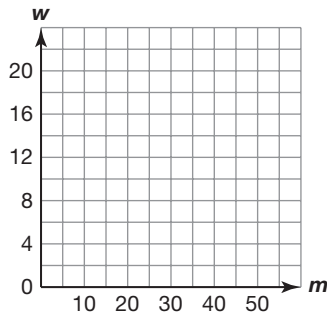
16.

x	z
25	0
35	10
50	25
75	50
100	75
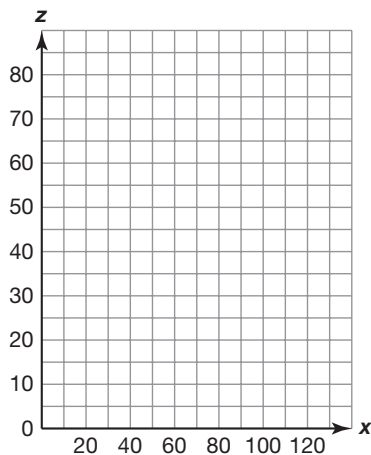
17.

g	h
30	2
75	5
90	6
127.50	8.50
150	10
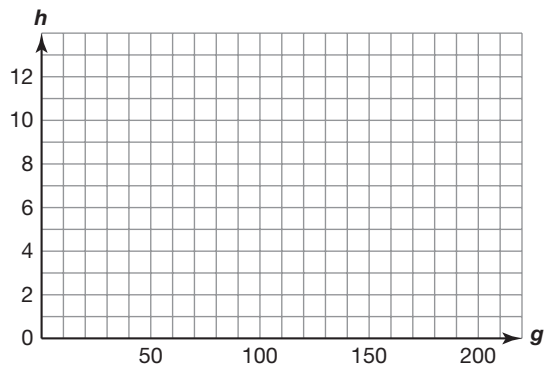
18.

x	y
50	5
65	20
90	45
105	60
125	80
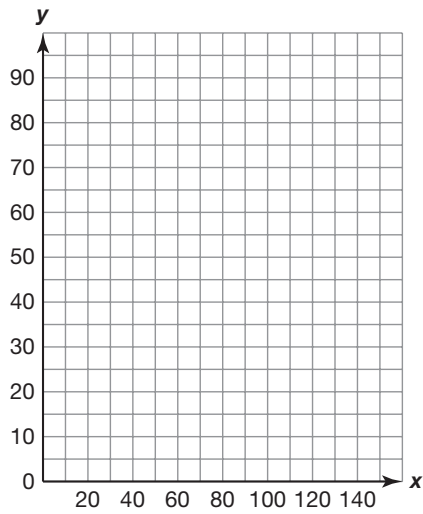
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Variables and More Variables
The Many Uses of Variables in Mathematics

Vocabulary

Write a definition for the following term in your own words.

1. homonyms

Problem Set

Determine each answer using the given formula.

1. The formula $C = 3.14d$ is used to calculate the circumference, C, of a circle with a diameter, d.
Calculate the circumference of a circle with a diameter of 8 inches.

$C = 3.14(8)$

$C = 25.12$

The circumference of the circle is 25.12 inches.

2. Use the formula $C = 3.14d$ to calculate the diameter of a circle with a circumference
of 15.7 centimeters.

3. The formula $P = 4s$ is used to calculate the perimeter, P, of a square with a side
length, s. Calculate the perimeter of a square with sides that are each 12 meters long.

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4. Use the formula $P = 4s$ to calculate the side lengths of a square with a perimeter of 30 feet.

5. The formula $A = bh$ is used to calculate the area, A, of a parallelogram with base length, b, and height, h. Calculate the area of a parallelogram with a base of 15 inches and a height of 9 inches.

6. Use the formula $A = bh$ to calculate the height of a parallelogram with an area of 38.50 square inches and a base of 11 inches.

7. The formula $C = \dfrac{F - 32}{1.8}$ is used to convert a temperature in degrees Fahrenheit, F, to a temperature in degrees Celsius, C. Calculate the temperature, in degrees Celsius, when the temperature is 86 degrees Fahrenheit.

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8. The formula $P = a + b + c$ is used to calculate the perimeter, P, of a triangle with side lengths a, b, and c. Calculate the unknown side length for a triangle with a perimeter of 25 inches and two sides measuring 7 inches each.

9

Solve each equation for the unknown quantity.

9. $3y = 18$

$$3y = 18$$
$$\frac{3y}{3} = \frac{18}{3}$$
$$y = 6$$

10. $m + 12 = 29$

11. $\frac{w}{6} = 96$

12. $a(11) = 33$

13. $3g = 6.3$

14. $\frac{t}{3.5} = 12$

Write another equation that can be used to represent each problem situation.

15. A problem situation can be represented by the equation $y = x + 58$.

Answers may vary. The equations $y - 58 = x$ and $y - x = 58$ can also be used to represent the problem situation.

16. A problem situation can be represented by the equation $m = 12g$.

17. A problem situation can be represented by the equation $w - z = 125$.

18. A problem situation can be represented by the equation $\frac{x}{22} = c$.

19. A problem situation can be represented by the equation $256 = w + z$.

20. A problem situation can be represented by the equation $xy = 18$.

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Quantities That Change
Independent and Dependent Variables

Vocabulary

Write the term that best completes each statement.

1. In a problem situation, when a quantity does not depend on another quantity it is called the
_____. This quantity is represented by the _____
in the equation that models the problem situation.

2. In a problem situation, when a quantity depends on another quantity it is called the
_____. This quantity is represented by the _____
in the equation that models the problem situation.

Problem Set

Name the two quantities that are changing in each and determine which quantity is the dependent quantity and which is the independent quantity.

1. Wanda earns $2 for every box of fruit sold as a fundraiser.

The dependent quantity is the total money earned by Wanda. The independent quantity is the number of boxes of fruit sold.

2. Mrs. Hart calculates quiz scores by giving students 4 points for every correct answer.

3. A car lot is offering a $2500 discount on all new car purchases.

4. A rental car company charges customers $40 for each day they rent a car.

5. A lawn care service charges $50 for each acre they mow.

6. Mr. Seraji adds 10 bonus points to each student's science test score to determine their final test score.

7. To determine the total weekly wages of his employees, Mr. Jackson multiplies the total number of hours his employees work by $12.

8. Terrence types 80 words per minute.

Determine the dependent variable and the independent variable in each given equation.

9. The equation $T = 75 - d$ is used to calculate the water temperature, T, at a depth, d, in a particular lake.

The variable T is the dependent variable because the temperature depends on the depth. The variable d is the independent variable.

10. The equation $N = 75t$ is used to model car traffic on a particular interstate. The variable N represents the number of cars that travel past a certain point, and the variable t represents the time in minutes.

11. At Connie's Computers, the equation $s = p - 49.99$ is used to determine the sale price, s, of laptop computers with an original price, p.

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12. The equation $w = 3500m$ is used to model the number of gallons of water, w, released from the Taylorsville Lake Dam each minute, m.

13. The equation $p = \dfrac{t}{3}$ is used to calculate the individual profit, p, made by each of three brothers operating a lemonade stand with a total profit, t.

14. The equation $m = 30h$ is used to model the number of miles, m, a cruise ship travels in h hours.

Use the given table of values to complete the graph. Determine which quantity should be plotted on each axis and label each axis accordingly.

15.

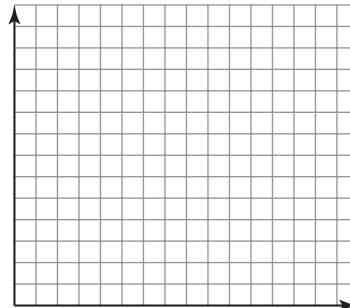| Distance Traveled (miles)	Time (hours)
14	2
21	3
35	5
49	7
63	9

Distance Traveled

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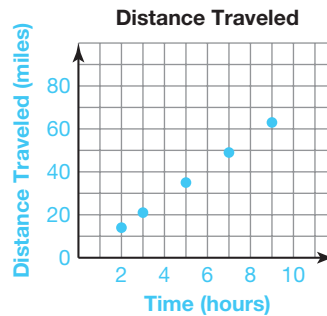
9

16.

Original Price ($)	Sale Price ($)
20	10
25	15
35	25
50	40
65	55

Price of Shoes

17.

Fruit Boxes Sold	Profit ($)
15	30
20	40
25	50
30	60
40	80

Profit from Fruit Sales
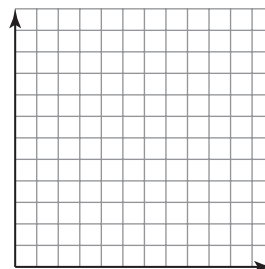
NAME_____ DATE _____

18.

Lake Water Temperature (°F)	Water Depth (meters)
70	5
65	10
60	15
50	25
45	30

Lake Temperature
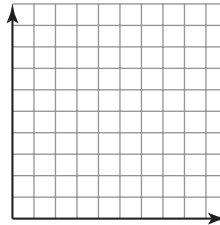
19.

Time (hours)	Scrap Metal Produced (tons)
2	9
3	13.50
5	22.50
8	36
10	45

Scrap Metal Produced

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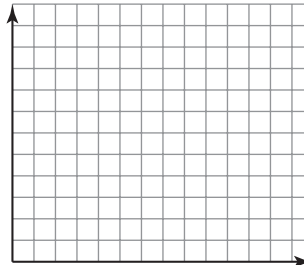
20.

Original Test Score	Test Score After Bonus
60	65
75	80
85	90
90	95
95	100

Test Scores