NAME ______________________ DATE ____________

Call to Order
Inequalities

Vocabulary

Write the term that best completes each statement.

1. A(n) graph of an inequality in one variable is the set of all points on a number line that makes the inequality true.
2. A(n) ray begins at a starting point and goes on forever in one direction.
3. Any mathematical sentence that has an inequality symbol is a(n) inequality.
4. The solution set of an inequality 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

   $6 \leq 8$

3. 10 is greater than or equal to 3

   $10 \geq 3$

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

   $4\frac{1}{3} < 4\frac{3}{4}$

5. 93.2 is greater than 91.7

   $93.2 > 91.7$

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

   $\frac{3}{8} \leq \frac{3}{8}$

9

Write the meaning of the inequality in words.

7. $14 \geq 13$

Fourteen is greater than or equal to thirteen.

8. $46.2 < 56.2$

Forty-six and two-tenths is less than fifty-six and two-tenths.

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

One-eighth is less than or equal to one-fifth.

10. $100.9 > 100.1$

One hundred and nine-tenths is greater than one hundred and one-tenth.

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

Six and three-fourths is less than eight and one-fourth.

12. $17.1 \geq 17.1$

Seventeen and one-tenth is greater than or equal to seventeen and one-tenth.

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

13. $5 \boxed{<} 8$

14. $\frac{3}{4} \boxed{>} \frac{3}{8}$

15. $7.35 \boxed{>} 7.32$

16. $12.1 \boxed{<} 12\frac{1}{5}$

17. $12.05 \boxed{<} 12.051$

18. $2\frac{4}{5} \boxed{>} 2.75$

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

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

20. $9.09 \boxed{\leq} 9.1$

21. $5\frac{1}{4} \boxed{\leq} 5\frac{1}{3}$

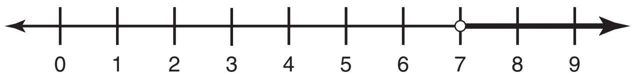
22. $\frac{3}{4} \boxed{\geq} \frac{5}{8}$

23. $1\frac{4}{5} \boxed{\geq} 1.75$

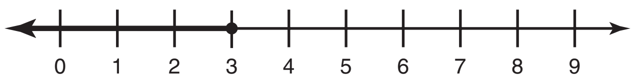
24. $2.22 \boxed{\leq} 2.222$

NAME ______________________ DATE ______________

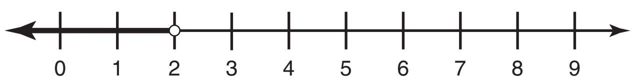
Write the inequality represented by the given graph.

25. 

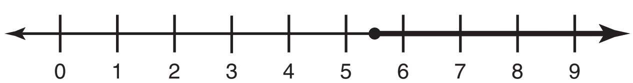
$x > 7$

26. 

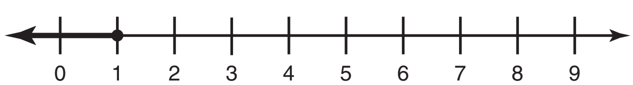
$x \leq 3$

27. 

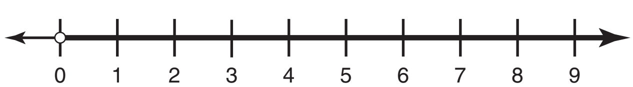
$x < 2$

28. 

$x \geq 5.5$

29. 

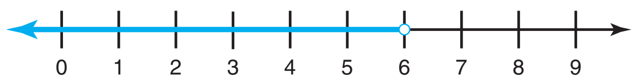
$x \leq 1$

30. 

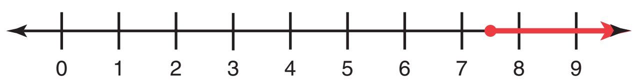
$x > 0$

Graph the solution set for each given inequality.

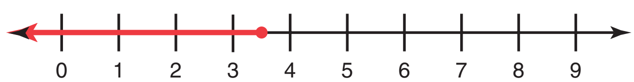
31. $x < 6$



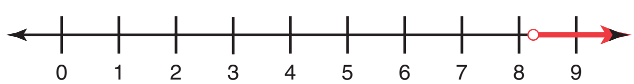
32. $x \geq 7.5$



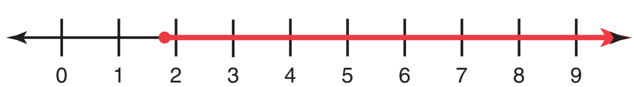
33. $3\frac{1}{2} \geq x$



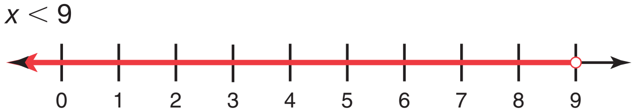
34. $x > 8.25$



35. $1.8 \leq x$



36. $x < 9$



NAME ______________________ DATE ______________

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

   A one-step equation is an equation that can be solved using only one operation.

2. solution

   A solution to an equation is any value for a variable that makes the equation true.

3. Property of Equality for Addition

   For all numbers a, b, and c: If $a = b$, then $a + c = b + c$.

4. Property of Equality for Subtraction

   For all numbers a, b, and c: If $a = b$, then $a - c = b - c$.

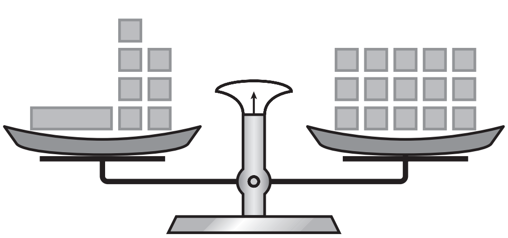
5. inverse operations

   Inverse operations are pairs of operations that undo each other.

Problem Set

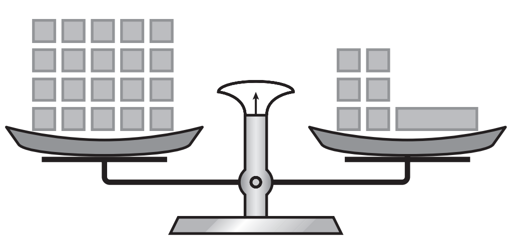
Determine what will balance 1 rectangle in each. Describe your strategies.

1.



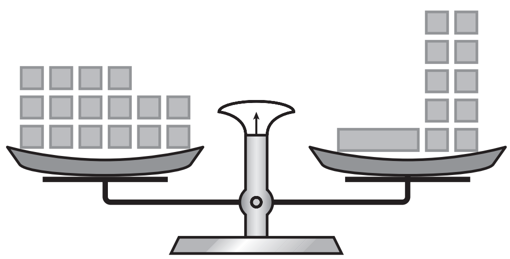
Eight squares will balance 1 rectangle.
I subtracted 7 squares from each side.

2.



Fourteen squares will balance 1 rectangle.
I subtracted 6 squares from each side.

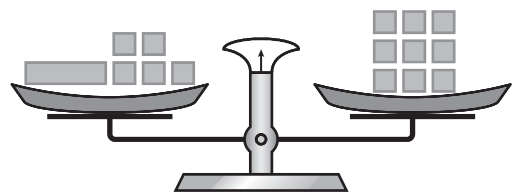
3.



Six squares will balance 1 rectangle.

I subtracted 10 squares from each side.

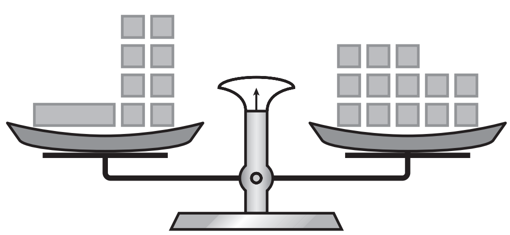
4.



Four squares will balance 1 rectangle.

I subtracted 5 squares from each side.

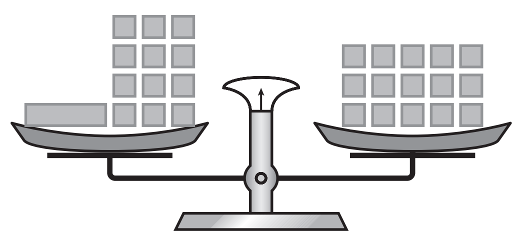
5.



Five squares will balance 1 rectangle.

I subtracted 8 squares from each side.

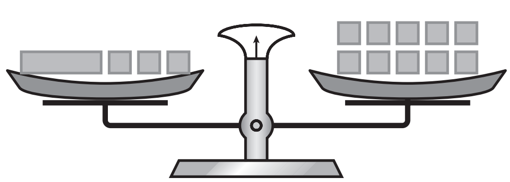
6.



Three squares will balance 1 rectangle.

I subtracted 12 squares from each side.

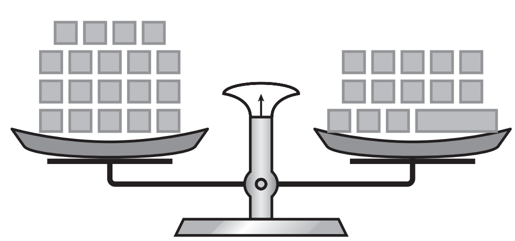
7.



Seven squares will balance 1 rectangle.

I subtracted 3 squares from each side.

8.



Six squares will balance 1 rectangle.

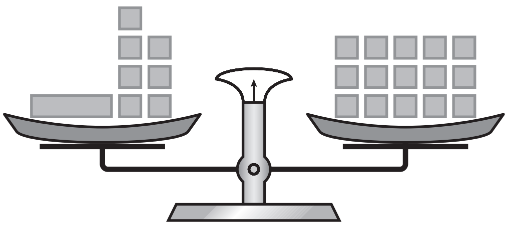
I subtracted 13 squares from each side.

NAME ____________________ DATE ____________

9

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

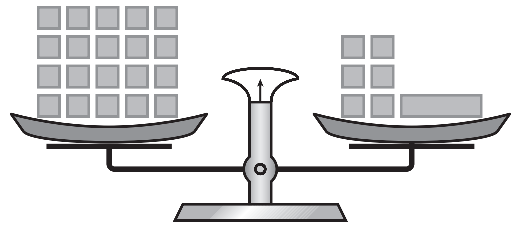
9.



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

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

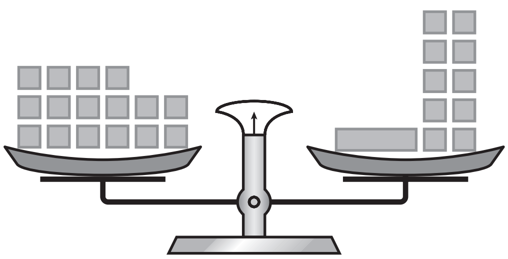
10.



$20 = x + 6$
$20 - 6 = x + 6 - 6$
$14 = x$

Check:
$20 = 14 + 6$
$20 = 20$

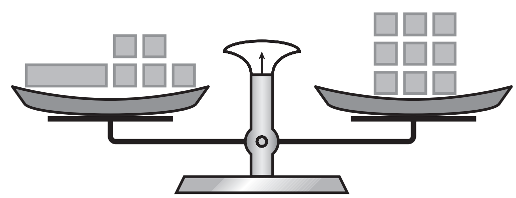
11.



$16 = x + 10$
$16 - 10 = x + 10 - 10$
$6 = x$

Check:
$16 = 6 + 10$
$16 = 16$

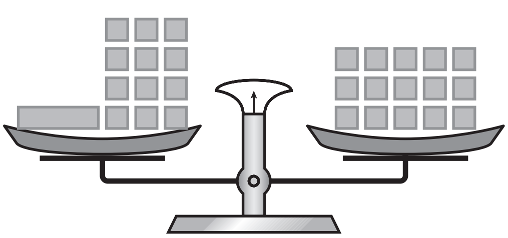
12.



$x + 5 = 9$
$x + 5 - 5 = 9 - 5$
$x = 4$

Check:
$4 + 5 = 9$
$9 = 9$

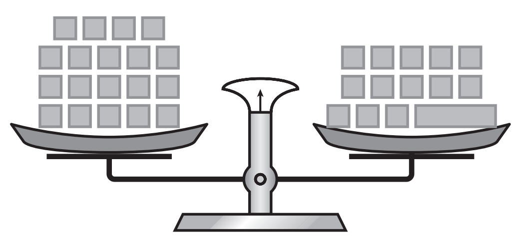
13.



$x + 12 = 15$
$x + 12 - 12 = 15 - 12$
$x = 3$

Check:
$3 + 12 = 15$
$15 = 15$

14.



$19 = x + 13$
$19 - 13 = x + 13 - 13$
$6 = x$

Check:
$19 = 6 + 13$
$19 = 19$

9

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

15. $d + 6 = 13$

Subtract 6 from each side.

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

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

16. $35 = t - 12$

Add 12 to each side.

$35 = t - 12$
$35 + 12 = t - 12 + 12$
$47 = t$

Check:
$35 = 47 - 12$
$35 = 35$

17. $x - 14 = 7$

Add 14 to each side.

$x - 14 = 7$
$x - 14 + 14 = 7 + 14$
$x = 21$

Check:
$21 - 14 = 7$
$7 = 7$

18. $x + 20 = 41$

Subtract 20 from each side.

$x + 20 = 41$
$x + 20 - 20 = 41 - 20$
$x = 21$

Check:
$21 + 20 = 41$
$41 = 41$

19. $29 = 17 + m$

Subtract 17 from each side.

$29 = 17 + m$
$29 - 17 = 17 - 17 + m$
$12 = m$

Check:
$29 = 17 + 12$
$29 = 29$

20. $c - 9 = 23$

Add 9 to each side.

$c - 9 = 23$
$c - 9 + 9 = 23 + 9$
$c = 32$

Check:
$32 - 9 = 23$
$23 = 23$

21. $33 + p = 33$

Subtract 33 from each side.

$33 + p = 33$
$33 - 33 + p = 33 - 33$
$p = 0$

Check:
$33 + 0 = 33$
$33 = 33$

22. $31 = f - 19$

Add 19 to each side.

$31 = f - 19$
$31 + 19 = f - 19 + 19$
$50 = f$

Check:
$31 = 50 - 19$
$31 = 31$

NAME _______________ DATE _______________

Determine if each solution is true. Explain your reasoning.

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

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

$32 \neq 42$

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

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

$19 = 23 - 7$

$19 \neq 16$

The value $s = 7$ is not a solution to $19 = 23 - s$.

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

$56 \stackrel{?}{=} 71 - 15$

$56 = 56$

The value $c = 71$ is a solution to the equation $56 = c - 15$.

.

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

$28 + 42 \stackrel{?}{=} 70$

$70 = 70$

The value $x = 28$ is a solution to $x + 42 = 70$.

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

$83 - 32 \stackrel{?}{=} 49$

$51 \neq 49$

The value $m = 83$ is not a solution to the equation $m - 32 = 49$.

9

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

$28 + 44 \stackrel{?}{=} 72$

$72 = 72$

The value $t = 44$ is a solution to the equation $28 + t = 72$.

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

$88 - 49 \stackrel{?}{=} 39$

$39 = 39$

The value $k = 49$ is a solution to $88 - k = 39$.

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

$57 \stackrel{?}{=} 34 + 13$

$57 \neq 47$

The value $z = 13$ is not a solution to $57 = 34 + z$.

NAME ______________________ DATE ______________

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

Vocabulary

1. State the Multiplication Property of Equality.

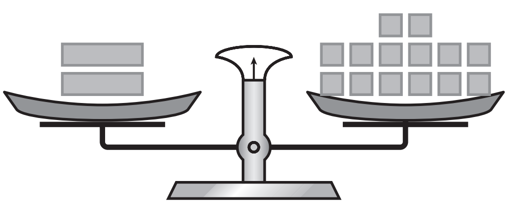
   For all numbers a, b, and c: If $a = b$, then $ac = bc$.

2. State the Division Property of Equality.

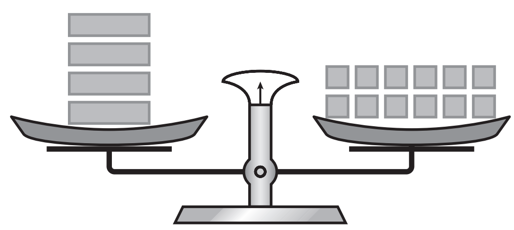
   For all numbers a, b, and c: If $a = b$, and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.

Problem Set

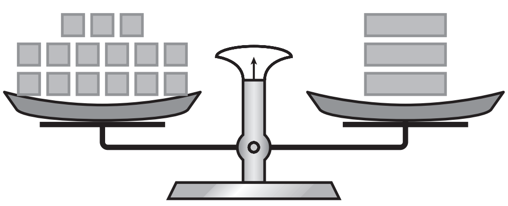
Determine what will balance 1 rectangle in each. Describe your strategies.

1. 

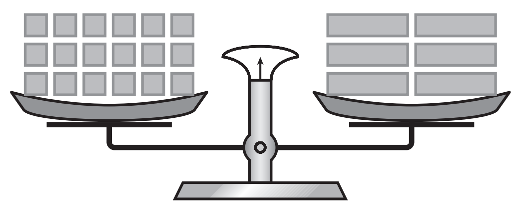
   Seven squares will balance 1 rectangle.
   I divided the 14 squares into 2 groups.

2. 

   Three squares will balance 1 rectangle.
   I divided the 12 squares into 4 groups.

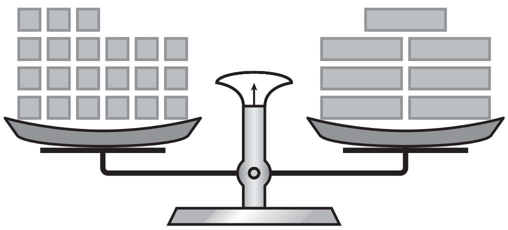
3. 

   Five squares will balance 1 rectangle.
   I divided the 15 squares into 3 groups.

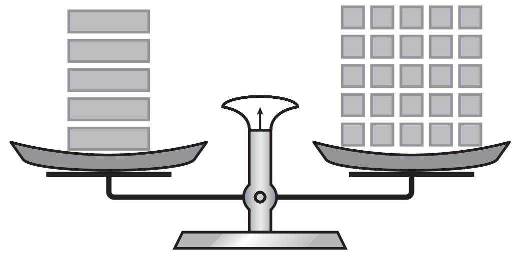
4. 

   Three squares will balance 1 rectangle.
   I divided the 18 squares into 6 groups.

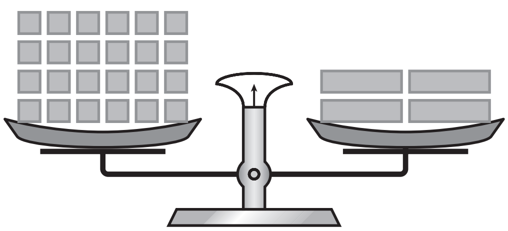
9

5. 

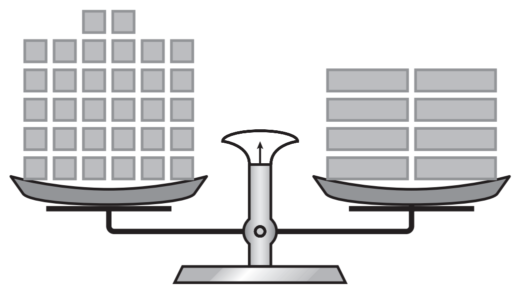
Three squares will balance 1 rectangle.
I divided the 21 squares into 7 groups.

6. 

Five squares will balance 1 rectangle.
I divided the 25 squares into 5 groups.

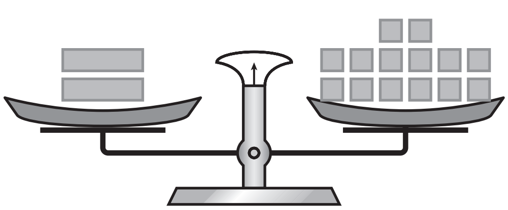
7. 

Six squares will balance 1 rectangle.
I divided the 24 squares into 4 groups.

8. 

Four squares will balance 1 rectangle.
I divided the 32 squares into 8 groups.

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

9. 

$2x = 14$

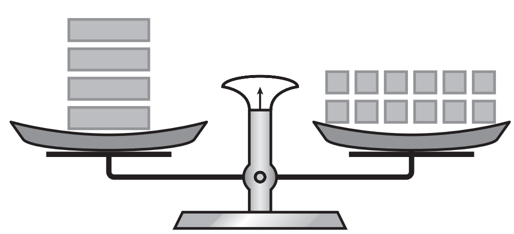
$\frac{2x}{2} = \frac{14}{2}$

$x = 7$

Check:

$2 \cdot 7 = 14$

$14 = 14$

10. 

$4x = 12$

$\frac{4x}{4} = \frac{12}{4}$

$x = 3$

Check:

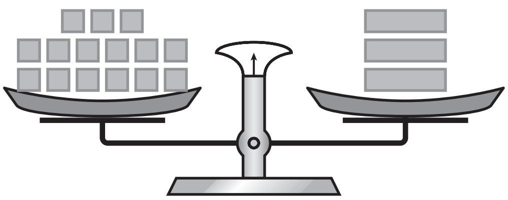
$4 \cdot 3 = 12$

$12 = 12$

NAME ____________________ DATE ____________

9

11.



$15 = 3x$

$\frac{15}{3} = \frac{3x}{3}$

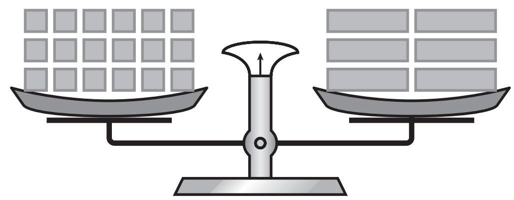
$5 = x$

Check:

$15 = 3 \cdot 5$

$15 = 15$

12.



$18 = 6x$

$\frac{18}{6} = \frac{6x}{6}$

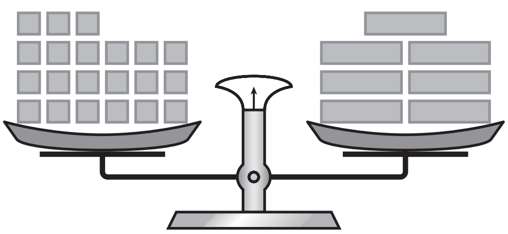
$3 = x$

Check:

$18 = 6 \cdot 3$

$18 = 18$

13.



$21 = 7x$

$\frac{21}{7} = \frac{7x}{7}$

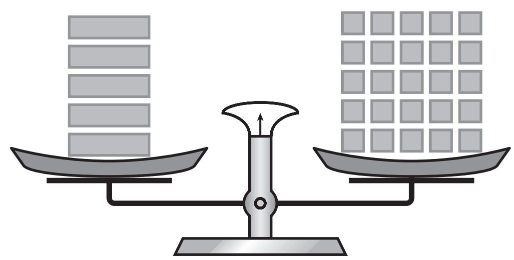
$3 = x$

Check:

$21 = 7 \cdot 3$

$21 = 21$

14.



$5x = 25$

$\frac{5x}{5} = \frac{25}{5}$

$x = 5$

Check:

$5 \cdot 5 = 25$

$25 = 25$

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

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

Multiply each side by 4.

$\frac{x}{4} = 12$

$4\left(\frac{x}{4}\right) = 4(12)$

$x = 48$

Check:

$\frac{48}{4} = 12$

$12 = 12$

16. $54 = 9p$

Divide each side by 9.

$54 = 9p$

$\frac{54}{9} = \frac{9p}{9}$

$6 = p$

Check:

$54 = 9 \cdot 6$

$54 = 54$

9

17. $13 = \frac{t}{7}$

Multiply each side by 7.

$$13 = \frac{t}{7}$$
$$7(13) = 7\left(\frac{t}{7}\right)$$
$$91 = t$$

Check:

$$13 = \frac{91}{7}$$
$$13 = 13$$

18. $\frac{m}{5} = 11$

Multiply each side by 5.

$$\frac{m}{5} = 11$$
$$5\left(\frac{m}{5}\right) = 5(11)$$
$$m = 55$$

Check:

$$\frac{55}{5} = 11$$
$$11 = 11$$

19. $8.5x = 51$

Divide each side by 8.5.

$$8.5x = 51$$
$$\frac{8.5x}{8.5} = \frac{51}{8.5}$$
$$x = 6$$

Check:

$$8.5 \cdot 6 = 51$$
$$51 = 51$$

20. $6y = 42$

Divide each side by 6.

$$6y = 42$$
$$\frac{6y}{6} = \frac{42}{6}$$
$$y = 7$$

Check:

$$6 \cdot 7 = 42$$
$$42 = 42$$

21. $18 = \frac{r}{3}$

Multiply each side by 3.

$$18 = \frac{r}{3}$$
$$3(18) = 3\left(\frac{r}{3}\right)$$
$$54 = r$$

Check:

$$18 = \frac{54}{3}$$
$$18 = 18$$

22. $144 = 12x$

Divide each side by 12.

$$144 = 12x$$
$$\frac{144}{12} = \frac{12x}{12}$$
$$12 = x$$

Check:

$$144 = 12 \cdot 12$$
$$144 = 144$$

NAME ______________________ DATE ____________

9

Determine if each solution is true. Explain your reasoning.

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

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

$200 \neq 2000$

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

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

$64 \stackrel{?}{=} 9 \cdot 7$

$64 \neq 63$

The value $t = 7$ is not a solution to $64 = 9t$.

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

$\frac{78}{6} \stackrel{?}{=} 13$

$13 = 13$

The value $n = 78$ is a solution to $\frac{n}{6} = 13$.

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

$26 \stackrel{?}{=} \frac{140}{5}$

$26 \neq 28$

The value $x = 140$ is not a solution to the equation $26 = \frac{x}{5}$.

9

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

$2 \cdot 19 \stackrel{?}{=} 38$

$38 = 38$

The value $y = 19$ is a solution to $2y = 38$.

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

$13 \stackrel{?}{=} \frac{52}{5}$

$13 \neq 10.4$

The value $q = 5$ is not a solution to $13 = \frac{52}{q}$.

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

$189 \stackrel{?}{=} 21 \cdot 8$

$189 \neq 168$

The value $m = 8$ is not a solution to the equation $189 = 21m$.

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

$\frac{252}{14} \stackrel{?}{=} 18$

$18 = 18$

The value $x = 252$ is a solution to the equation $\frac{x}{14} = 18$.

NAME _______________________________ DATE _______________

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.

   Let m represent the number of gallons of milk produced and let t represent the number of minutes spent milking.

   $m = 3.8t$

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.

   Let p represent the total profit made (in dollars) and let g represent the number of gallons of lemonade sold.

   $p = 2.50g$

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.

Let j represent the weight of a jockey (in pounds) and let g represent the weight of the jockey's gear (in pounds).

$j + g = 126$

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.

Let t represent the total cost of an order and let m represent the cost of the merchandise ordered.

$t = m + 4.99$

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.

Let b represent the number of aluminum bats produced and let a represent the number of tons of aluminum used.

$b = 900a$

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	200
13	325
20	500
25	625

9. $7.25 + w = z$

w	z
2	9.25
6	13.25
10.50	17.75
16.30	23.55
22.75	30

NAME _______________ DATE _______________

9

10. $3.4x = y$

x	y
3	10.20
5	17
10	34
15	51
22	74.80

11. $k = g + 22.3$

g	k
5	27.30
12	34.30
22.30	44.60
30.90	53.20
46.80	69.10

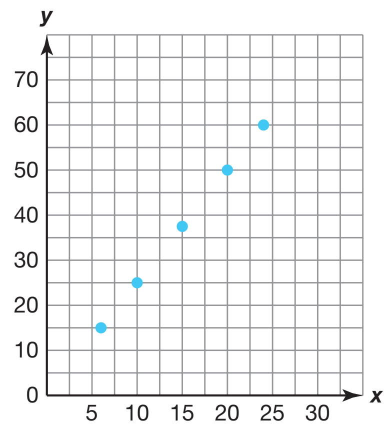
12. $w = 11.1m$

m	w
2	22.20
8	88.80
12	133.20
22	244.20
30	333

Use the given table of values to complete each graph.

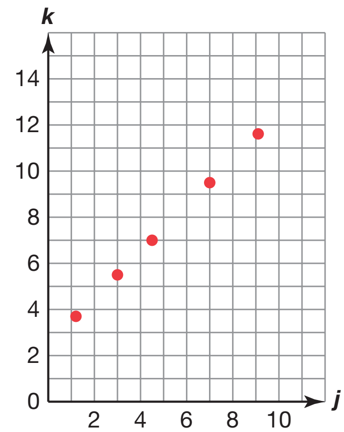
13.

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



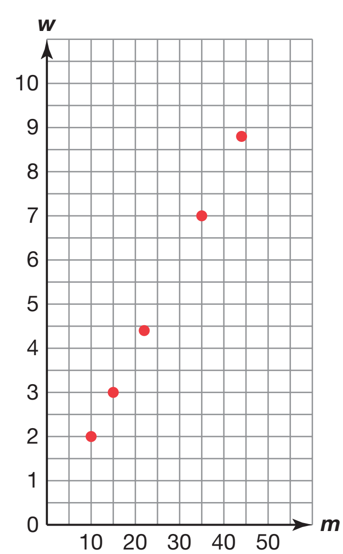
14.

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



15.

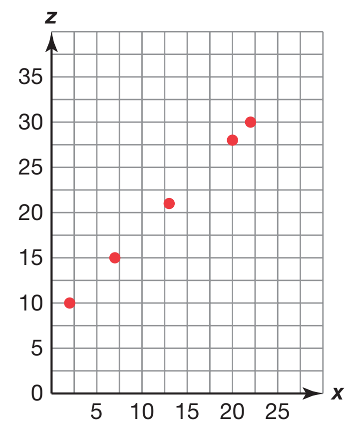
m	w
10	2
15	3
22	4.40
35	7
44	8.80



NAME ______________________ DATE ______________

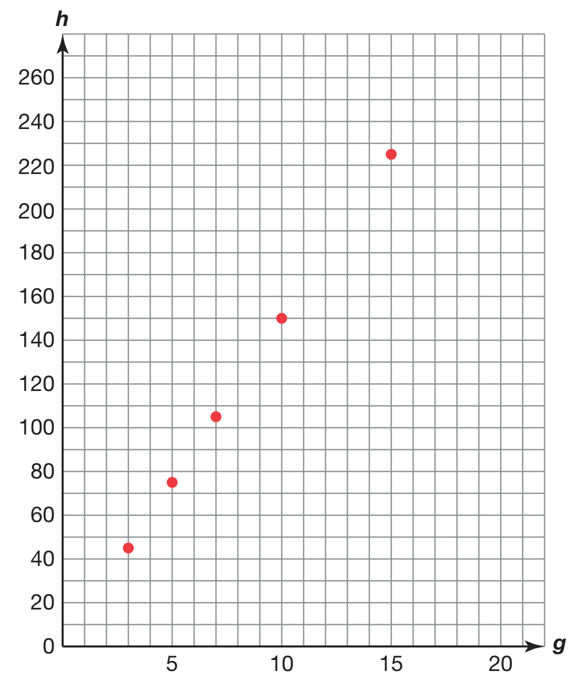
16.

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



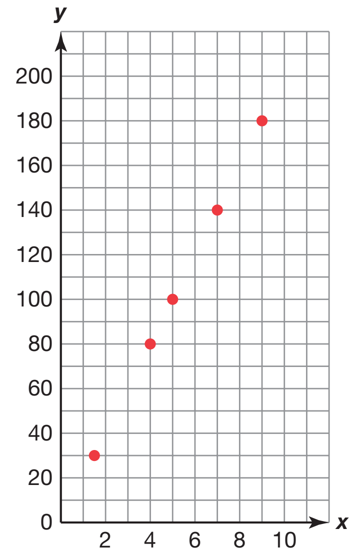
17.

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



NAME ______________________ DATE ____________

Measuring Short
Using Multiple Representations to Solve Problems

Problem Set

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.

   Let t represent the total profit made on the construction of a new home and let m represent the profit made by each individual.

   $m = \frac{t}{3}$

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.

   Let g represent an employee's gross weekly pay (in dollars) and let n represent the employee's pay (in dollars) after the uniform deduction.

   $n = g - 7.50$

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.

   Let *t* represent the number of crates on a truck and let *c* represent the number of crates each employee unloads from the truck.

   $c = \frac{t}{5}$

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.

   Let *t* represent the actual air temperature and let *w* represent the wind chill temperature.

   $w = t - 10$

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.

   Let *g* represent the number of pounds of grain fed to the cows on a given day and let *c* represent the average amount of grain (in pounds) consumed by each cow daily.

   $c = \frac{g}{75}$

NAME ______________________ DATE ______________

9

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

t	m
16	2
40	5
56	7
88	11
100	12.50

9. $w - 33.5 = z$

w	z
33.50	0
45	11.50
50.50	17
72	38.50
100	66.50

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

x	y
22	4
27.50	5
55	10
71.50	13
90.75	16.50

11. $k = g - 105.2$

g	k
120	14.80
150.60	45.40
205.20	100
245.3	140.10
300	194.80

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

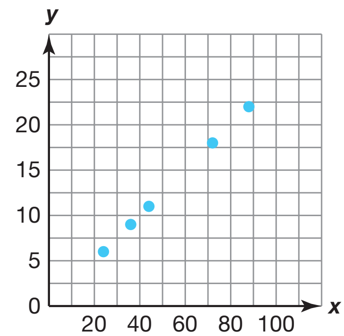
m	w
27.6	3
46	5
74.52	8.10
92	10
128.80	14

9

Use the given table of values to complete each graph.

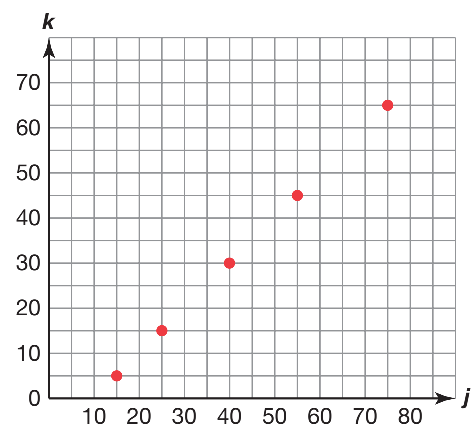
13.

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



14.

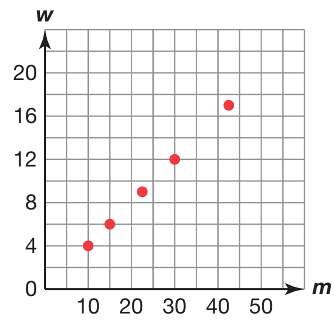
j	k
15	5
25	15
40	30
55	45
75	65



NAME ____________________ DATE ____________

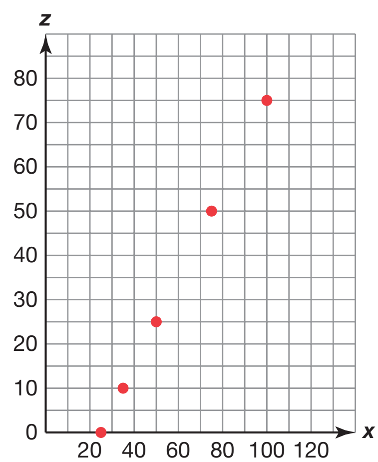
15.

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



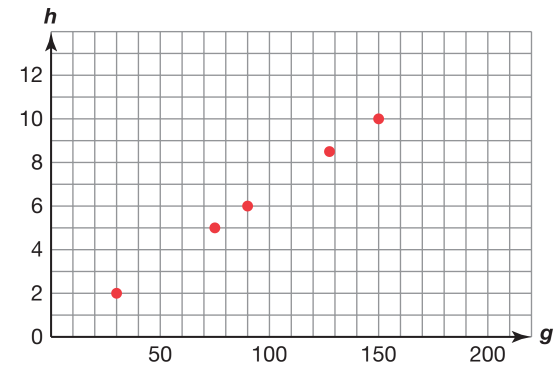
16.

x	*z*
25	0
35	10
50	25
75	50
100	75



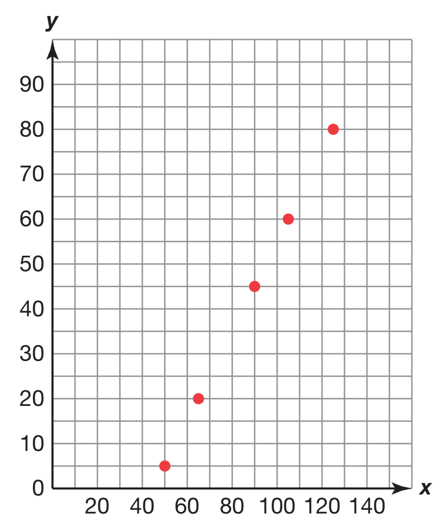
17.

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



NAME ______________________ DATE ____________

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

   Homonyms are words that have the same spelling and pronunciation, but have different meanings.

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.

   $15.7 = 3.14d$

   $\frac{15.7}{3.14} = \frac{3.14d}{3.14}$

   $5 = d$

   The diameter of the circle is 5 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.

   $P = 4(12)$

   $P = 48$

   The perimeter of the square is 48 meters.

9

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

$$30 = 4s$$
$$\frac{30}{4} = \frac{4s}{4}$$
$$7.50 = s$$

The length of each side of the square is 7.50 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.

$$A = 15(9)$$
$$A = 135$$

The area of the parallelogram is 135 square 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.

$$38.50 = 11h$$
$$\frac{38.50}{11} = \frac{11h}{11}$$
$$3.50 = h$$

The height of the parallelogram is 3.50 inches.

7. The formula $C = \frac{F - 32}{1.8}$ 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.

$$C = \frac{86 - 32}{1.8}$$
$$C = \frac{54}{1.8} = 30$$

The temperature is 30 degrees Celsius.

NAME ______________________ DATE ______________

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.

$25 = a + 7 + 7$

$25 = a + 14$

$25 - 14 = a + 14 - 14$

$11 = a$

The unknown side length of the triangle is 11 inches.

Solve each equation for the unknown quantity.

9. $3y = 18$

$3y = 18$

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

$y = 6$

10. $m + 12 = 29$

$m + 12 = 29$

$m + 12 - 12 = 29 - 12$

$m = 17$

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

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

$\frac{w}{6} \times 6 = 96 \times 6$

$w = 576$

12. $a(11) = 33$

$a(11) = 33$

$\frac{a(11)}{11} = \frac{33}{11}$

$a = 33$

13. $3g = 6.3$

$3g = 6.3$

$\frac{3g}{3} = \frac{6.3}{3}$

$g = 2.1$

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

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

$\frac{t}{3.5} \times 3.5 = 12 \times 3.5$

$t = 42$

9

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 $m = 12g$.

Answers may vary. The equations $\frac{m}{12} = g$ and $\frac{m}{g} = 12$ can also be used to represent the problem situation.

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

Answers may vary. The equations $w = 125 + z$ and $w - 125 = z$ can also be used to represent the problem situation.

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

Answers may vary. The equations $x = 22c$ and $\frac{x}{c} = 22$ can also be used to represent the problem situation.

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

Answers may vary. The equations $256 - w = z$ and $256 - z = w$ can also be used to represent the problem situation.

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

Answers may vary. The equations $x = \frac{18}{y}$ and $y = \frac{18}{x}$ can also be used to represent the problem situation.

Lesson 9.7 Skills Practice

NAME ____________________ DATE ____________

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 independent quantity. This quantity is represented by the independent variable in the equation that models the problem situation.

2. In a problem situation, when a quantity depends on another quantity it is called the dependent quantity. This quantity is represented by the dependent variable 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.

   The quiz score is the dependent quantity. The number of correct answers is the independent quantity.

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

   The sale price of each car is the dependent quantity. The original price of each car is the independent quantity.

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

   The total charges are the dependent quantity. The number of days a car is rented is the independent quantity.

9

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

The total mowing cost is the dependent quantity. The number of acres the lawn service mows is the independent quantity.

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

The final test score is the dependent quantity. The original test score before the bonus is the independent quantity.

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

The total weekly wages is the dependent quantity. The total number of hours worked by the employees is the independent quantity.

8. Terrence types 80 words per minute.

The total number of words typed is the dependent quantity. The total number of minutes Terrence types is the independent quantity.

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.

The variable N is the dependent variable because the number of cars that travel past a certain point depends on the amount of time that passes. The variable t is the independent variable.

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.

The variable s is the dependent variable because the sale price depends on the original price of the laptop. The variable p is the independent variable.

NAME ______________________ DATE ____________

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.

The variable w is the dependent variable because the amount of water released depends on the number of minutes that pass. The variable m is the independent variable.

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

The variable p is the dependent variable because the profit made by each individual depends on the total profit. The variable t is the independent variable.

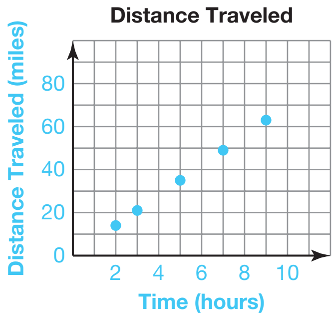
14. The equation $m = 30h$ is used to model the number of miles, m, a cruise ship travels in h hours.

The variable m is the dependent variable because the number of miles traveled depends on the number of hours the cruise ship is moving. The variable h is the independent variable.

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

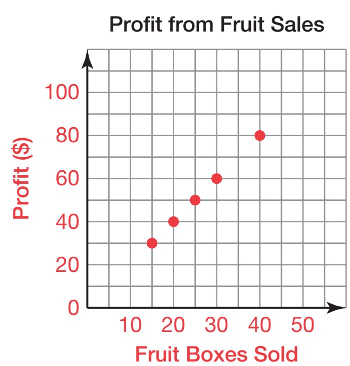


16.

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

17.

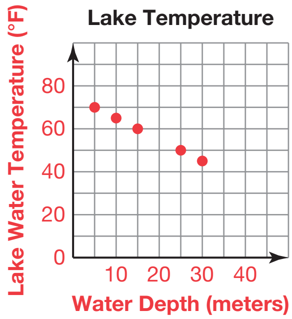
Fruit Boxes Sold	Profit ($)
15	30
20	40
25	50
30	60
40	80



NAME ____________ DATE ____________

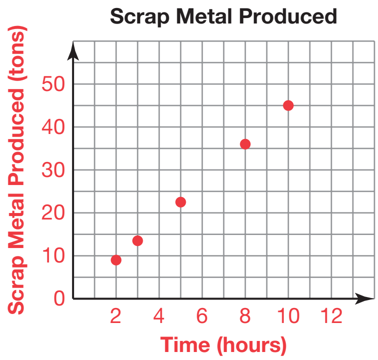
18.

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



19.

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



20.

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