

Name \_\_\_\_\_

Date \_\_\_\_\_

## Writing and Evaluating Expressions—Multiplication and Division

Anna charges \$8.50 per hour to babysit. Complete the table, and answer the questions below.

Number of Hours	Amount Anna Charges in Dollars
1	
2	
5	
8	
$H$	

a. Write an expression describing her earnings for working  $H$  hours.

b. How much will she earn if she works for  $3\frac{1}{2}$  hours?

c. How long will it take Anna to earn \$51.00?

1. A radio station plays 12 songs each hour. They never stop for commercials, news, weather, or traffic reports.
  - a. Write an expression describing how many songs are played by the radio station in  $H$  hours.
  - b. How many songs will be played in an entire day (24 hours)?
  - c. How long does it take the radio station to play 60 consecutive songs?
  
2. A ski area has a high speed lift that can move 2,400 skiers to the top of the mountain each hour.
  - a. Write an expression describing how many skiers can be lifted in  $H$  hours.
  - b. How many skiers can be moved to the top of the mountain in 14 hours?
  - c. How long will it take to move 3,600 skiers to the top of the mountain?
  
3. Polly writes a magazine column, for which she earns \$35 per hour. Create a table of values that shows the relationship between the number of hours that Polly works,  $H$ , and the amount of money Polly earns in dollars,  $E$ .


- a. If you know how many hours Polly works, can you determine how much money she earned? Write the corresponding expression.
- b. Use your expression to determine how much Polly earned after working for  $3\frac{1}{2}$  hours.
- c. If you know how much money Polly earned, can you determine how long she worked? Write the corresponding expression.
- d. Use your expression to determine how long Polly worked if she earned \$52.50.

4. Mitchell delivers newspapers after school, for which he earns \$0.09 per paper. Create a table of values that shows the relationship between the number of papers that Mitchell delivers,  $P$ , and the amount of money Mitchell earns in dollars,  $E$ .


- If you know how many papers Mitchell delivered, can you determine how much money he earned? Write the corresponding expression.
  - Use your expression to determine how much Mitchell earned by delivering 300 newspapers.
  - If you know how much money Mitchell earned, can you determine how many papers he delivered? Write the corresponding expression.
  - Use your expression to determine how many papers Mitchell delivered if he earned \$58.50 last week.
5. Randy is an art dealer who sells reproductions of famous paintings. Copies of the *Mona Lisa* sell for \$475.
- Last year Randy sold \$9,975 worth of *Mona Lisa* reproductions. How many did he sell?
  - If Randy wants to increase his sales to at least \$15,000 this year, how many copies will he need to sell (without changing the price per painting)?

1. Anna charges \$8.50 per hour to babysit. Complete the table and answer the questions below.

Number of Hours	Amount Anna Charges in Dollars
1	8.50
2	17.00
5	42.50
8	68
$H$	$8.50H$ or $8.5H$

- a. Write an expression describing her earnings for working  $H$  hours.

$8.50H$  or  $8.5H$

- b. How much will she earn if she works for  $3\frac{1}{2}$  hours?

If  $H = 3.5$ , then  $8.5H = 8.5 \cdot 3.5 = 29.75$ . She will earn \$29.75.

- c. How long will it take Anna to earn \$51.00?

$51 \div 8.5 = 6$ . It will take Anna 6 hours to earn \$51.00.

1. A radio station plays 12 songs each hour. They never stop for commercials, news, weather, or traffic reports.

- a. Write an expression describing how many songs are played by the radio station in  $H$  hours.

$12H$

- b. How many songs will be played in an entire day (24 hours)?

$12 \cdot 24 = 288$ . There will be 288 songs played.

- c. How long does it take the radio station to play 60 consecutive songs?

$60 \text{ songs} \div \frac{12 \text{ songs}}{1 \text{ hour}} = 5 \text{ hours}$

2. A ski area has a high speed lift that can move 2,400 skiers to the top of the mountain each hour.

- a. Write an expression describing how many skiers can be lifted in  $H$  hours.

$2,400H$

- b. How many skiers can be moved to the top of the mountain in 14 hours?

$14 \cdot 2,400 = 33,600$ . 33,600 skiers can be moved.

- c. How long will it take to move 3,600 skiers to the top of the mountain?

$3,600 \div 2,400 = 1.5$ . It will take an hour and a half to move 3,600 skiers to the top of the mountain.

3. Polly writes a magazine column, for which she earns \$35 per hour. Create a table of values that shows the relationship between the number of hours that Polly works,  $H$ , and the amount of money Polly earns in dollars,  $E$ .

Answers will vary. Sample answers are shown.

Hours Polly Works ( $H$ )	Polly's Earnings in Dollars ( $E$ )
1	35
2	70
3	105
4	140

- a. If you know how many hours Polly works, can you determine how much money she earned? Write the corresponding expression.

Multiplying the number of hours that Polly works by her rate (\$35 per hour) will calculate her pay.  $35H$  is the expression for her pay in dollars.

- b. Use your expression to determine how much Polly earned after working for  $3\frac{1}{2}$  hours.

$35H = 35 \cdot 3.5 = 122.5$ . Polly makes \$122.50 for working  $3\frac{1}{2}$  hours.

- c. If you know how much money Polly earned, can you determine how long she worked? Write the corresponding expression.

Dividing Polly's pay by 35 will calculate the number of hours she worked.  $E \div 35$  is the expression for the number of hours she worked.

- d. Use your expression to determine how long Polly worked if she earned \$52.50.

$52.50 \div 35 = 1.5$ ; Polly worked an hour and a half for \$52.50.

4. Mitchell delivers newspapers after school, for which he earns \$0.09 per paper. Create a table of values that shows the relationship between the number of papers that Mitchell delivers,  $P$ , and the amount of money Mitchell earns in dollars,  $E$ .

Answers will vary. Sample answers are shown.

Number of Papers Delivered ( $P$ )	Mitchell's Earnings in Dollars ( $E$ )
1	0.09
10	0.90
100	9.00
1000	90.00

- a. If you know how many papers Mitchell delivered, can you determine how much money he earned? Write the corresponding expression.

Multiplying the number of papers that Mitchell delivers by his rate (\$0.09 per paper) will calculate his pay.  $0.09P$  is the expression for his pay in dollars.

- b. Use your expression to determine how much Mitchell earned by delivering 300 newspapers.  
 $0.09P = 0.09 \cdot 300 = 27$ . *Mitchell earned \$27.00 for delivering 300 newspapers.*
- c. If you know how much money Mitchell earned, can you determine how many papers he delivered? Write the corresponding expression.  
*Dividing Mitchell's pay by \$0.09 will calculate the number of papers he delivered.  $E \div 0.09$  is the expression for the number of papers he delivered.*
- d. Use your expression to determine how many papers Mitchell delivered if he earned \$58.50 last week.  
 $58.50 \div 0.09 = 650$ ; *therefore, Mitchell delivered 650 newspapers last week.*
5. Randy is an art dealer who sells reproductions of famous paintings. Copies of the *Mona Lisa* sell for \$475.
- a. Last year Randy sold \$9,975 worth of *Mona Lisa* reproductions. How many did he sell?  
 $9,975 \div 475 = 21$ . *He sold 21 copies of the painting.*
- b. If Randy wants to increase his sales to at least \$15,000 this year, how many copies will he need to sell (without changing the price per painting)?  
 $15,000 \div 475$  is about 31.6. *He will have to sell 32 paintings in order to increase his sales to at least \$15,000.*