

## **Ace Your Math Test Reproducible Worksheets**

These worksheets practice math concepts explained in Percents and Ratios (ISBN: 978-0-7660-3781-6), written by Rebecca Wingard-Nelson.

Ace Your Math Test reproducible worksheets are designed to help teachers, parents, and tutors use the books from the Ace Your Math Test series in the classroom and the home. The answers to the problems are contained in the Answers section starting on page 26.

Teachers, librarians, tutors, and parents are granted permission and are encouraged to make photocopies of these worksheets.

These worksheets are reproducible for educational use only and are not for resale. © 2011 Enslow Publishers, Inc.

Visit [www.enslow.com](http://www.enslow.com) and search for the Ace Your Math Test series to download worksheets for the following titles:

Addition and Subtraction  
978-0-7660-3778-6

Fractions and Decimals  
978-0-7660-3780-9

Geometry  
978-0-7660-3783-0

Multiplication and Division  
978-0-7660-3779-3

Percents and Ratios  
978-0-7660-3781-6

Pre-Algebra and Algebra  
978-0-7660-3782-3

Titles in this series can be purchased directly from:

Enslow Publishers, Inc.  
40 Industrial Road, Box 398  
Berkeley Heights, NJ 07922-0398  
Phone: 1-800-398-2504  
email: [customerservice@enslow.com](mailto:customerservice@enslow.com)  
Web Page: <http://www.enslow.com>

# Ratios Test

## Multiple Choice

1. The numbers in a ratio are called its \_\_\_\_\_.

- a. digits                      b. fractions  
c. parts                        d. terms

**Andrew has two barns, 12 chickens, 2 ducks, 3 horses, 6 pigs, 5 cows, 8 cats, and 2 dogs.**

2. What is the ratio of cows to horses?

- a. 3 : 5    b. 3 : 8    c. 5 : 3    d. 5 : 6

3. What is the ratio of barns to animals?

- a. 1 : 19    b. 2 : 37    c. 1 : 20    d. 1 : 13

4. What is the ratio of chickens to ducks?

- a. 2 : 12    b. 12 : 5    c. 3 : 12    d. 12 : 2

5. Josh and Mary shared a canoe. Josh paddled the first 3 miles. Then Mary paddled another 8 miles. What is the ratio of Josh's miles to the entire trip?

- a. 3 : 8                        b. 8 : 11  
c. 3 : 11                      d. 11 : 8

## Show Your Work

6. A class has 15 girls and 11 boys. What is the ratio of boys to girls?

7. A box of cookies has 6 chocolate chip, 4 sugar, and 8 peanut butter cookies. What is the ratio of peanut butter cookies to total cookies?

## Explain Your Answer

8. A table holds 4 cheese pizzas, 4 pepperoni pizzas, and 2 supreme pizzas. How can you write a ratio that compares part of the pizzas to the total?

# Equivalent Ratios Test

## Multiple Choice

- Which ratio is equivalent to 1 : 3?  
a. 3 : 1    b. 6 : 9    c. 3 : 9    d. 4 : 10
- Which two ratios are equivalent?  
A. 15 : 20    B. 4 : 5    C. 5 : 4    D. 3 : 4  
a. A and B                      b. A and D  
c. B and C                      d. C and D
- Gerald caught 9 trout and 8 blue gill.  
What ratio is equivalent to the ratio of trout to blue gill?  
a. 12 : 9    b. 6 : 4    c. 5 : 4    d. 18 : 16
- The ratio of dogs to cats at a local shelter is 2 to 5. What is an equivalent ratio to 2 to 5?  
a. 8 : 20    b. 10 : 15    c. 6 : 9    d. 4 : 20
- Mr. Boylan collected 12 frogs for every 4 toads he found. Which is the same as the ratio of toads to frogs?  
a. 1 to 3    b. 24 to 8    c. 2 to 8    d. 8 to 16

## Show Your Work

- Write a ratio equivalent to 1 to 5.
- Which ratio is not equivalent to the others?  
2 : 7            3 : 9            4 : 14            6 : 21

## Explain Your Answer

- Carol sold 420 student tickets and 150 adult tickets to the school play. This is a ratio of 42 to 15. Why might she decide to keep the actual numbers instead of an equivalent ratio?

## Reducing Ratios Test

### Multiple Choice

- Which are factors of 18?
  - 1, 2, 3, 6, 9, 18
  - 2, 6, 9, 10, 18
  - 3, 6, 18, 36
  - 18, 36, 54
- What are the common factors of 18 and 24?
  - 1, 2, 3, 6, 9
  - 1, 2, 3
  - 1, 2, 3, 6
  - 1, 2, 3, 4, 6
- What is the greatest common factor of 30 and 70?
  - 2
  - 5
  - 10
  - 15
- Which ratio is equivalent to 5 : 40?
  - 1 : 8
  - 2 : 20
  - 4 : 8
  - 4 : 10
- Wendy baked 220 cupcakes and 40 round cakes. What is the ratio of round cakes to cupcakes in lowest terms?
  - 40 to 220
  - 20 to 110
  - 10 to 55
  - 2 to 11

### Show Your Work

- Find the greatest common factor of 36 and 64.
- Andrew has 14 rabbits and 28 chickens. In lowest terms, what is the ratio of rabbits to chickens?

### Explain Your Answer

- Brenda reduced the ratio 27 : 81 to 9 : 27. Is the ratio in lowest terms? Explain.

# Rates Test

## Multiple Choice

- Which of the following is not a rate?
  - 4 boys per class
  - 18 to 7
  - \$20/hour
  - 1 teacher per bus
- For every 3 dogs Carol has, she keeps 12 biscuits. Which is the correct rate?
  - 1 dog per 2 biscuits
  - 1 dog per 6 biscuits
  - 6 biscuits per dog
  - 4 biscuits per dog
- What is the pay rate for someone who works 3 hours and earns \$21?
  - \$5/hour
  - \$6/hour
  - \$7/hour
  - \$8/hour
- Daniel walked 24 miles in 8 hours. What was his average walking rate?
  - 2 miles per hour
  - 3 miles per hour
  - 4 miles per hour
  - 6 miles per hour
- Lars drove 350 miles using 20 gallons of fuel. What was his fuel mileage?
  - 15 miles per gallon
  - 16 miles per gallon
  - 17 miles per gallon
  - 17.5 miles per gallon

## Show Your Work

- Colleen sold 14 belts for \$210. What was her rate per belt?
- Mikael worked 5 hours on Tuesday and 6 hours on Wednesday. She earned \$88. What was her pay rate?

## Explain Your Answer

- Teri can make 8 friendship bracelets in 6 hours. In lowest terms, at what rate does Teri make the bracelets? Explain.

## Ratios, Fractions, and Decimals Test

### Multiple Choice

- Which are multiples of 9?
  - 1, 3, 9
  - 3, 6, 9, 12
  - 18, 24, 30, 36
  - 18, 27, 36, 45
- Which are common multiples of 6 and 8?
  - 1, 2, 3
  - 6, 8, 12, 16
  - 24, 48, 72, 96
  - 24, 36, 48, 60
- What is the least common multiple of 4, 6, and 9?
  - 12
  - 18
  - 27
  - 36
- Which is the correct whole number ratio for  $\frac{2}{3}$  to  $\frac{3}{5}$ ?
  - $\frac{6}{5}$
  - $\frac{6}{15}$
  - $\frac{8}{15}$
  - $\frac{10}{9}$
- A batch of chili uses 1.5 pounds of ground meat for every 2 pounds of tomatoes. What is the whole number ratio for meat to tomatoes?
  - 3 : 1
  - 3 : 4
  - 1 : 3
  - 4 : 3
- Multiply 4.635 by 1,000
  - 0.4635
  - 46.35
  - 463.5
  - 4,635

### Show Your Work

- $100 \times 23.6 = \underline{\hspace{2cm}}$
- Write  $2\frac{1}{4}$  to  $\frac{1}{3}$  as a whole number ratio.
- What is the least common multiple of 12 and 16?

### Explain Your Answer

- Explain how to change the ratio 1.4 to 8 to a whole number ratio.

# Unit Rates Test

## Multiple Choice

- Which of the following is a unit ratio?  
a. 7 : 6    b. 1 : 9    c. 5 : 1    d. 1 : 7
- Which is a unit rate?  
a. 55 miles per hour  
b. 5 oats to 3 bran  
c. 1 out of 3  
d. 2.25 miles to 60 minutes
- Jerina's horse ran 1.4 miles in 2.8 minutes. What was her speed?  
a. 0.07 miles per minute  
b. 0.5 miles per minute  
c. 35 miles per hour  
d. 40 miles per hour
- Josh has 300 DVDs and 75 Blu-ray movies. What is the unit ratio of DVDs to Blu-ray movies?  
a. 1 to 4                      b. 4 to 1  
c. 300 to 75                d. 25 to 100
- Michelle typed 1,260 words in 30 minutes. What is her typing speed?  
a. 40 words per minute  
b. 42 words per minute  
c. 62 words per minute  
d. 84 words per minute

## Show Your Work

- Dante drove 410 miles on 16.4 gallons of fuel. What was his fuel mileage?
- Penny worked 8 hours and earned \$70. What is her hourly rate?
- Tina went to 6 stores in 3 hours and spent \$540. What is her spending rate per hour?

## Explain Your Answer

- Gina can type 65 words per minute. Explain how to find the unit rate for Gina's typing per hour.

# The Better Buy Test

## Multiple Choice

1. A dozen ears of corn are sold at the farmers market for \$3.00. What is the price per ear?  
a. \$0.25   b. \$0.30   c. \$0.50   d. \$0.75
2. Dwayne bought 12 pounds of nails for \$45.48. What was the price per pound?  
a. \$7.89   b. \$7.39   c. \$3.79   d. \$3.50
3. A package of 10 CDs costs \$2.30. A package of 50 CDs costs \$10.50. Which is the better buy?  
a. The 10 CDs  
b. The 50 CDs  
c. They are the same.
4. A peanut vendor sells roasted peanuts in three sized bags: 2 pounds for \$3, 5 pounds for \$7.50, or 8 pounds for \$12. Which is the best buy?  
a. 2 pounds                      b. 5 pounds  
c. 8 pounds                        d. They are the same.
5. A 30-lb bag of dog food costs \$15.50. A 50-lb bag of the same brand costs \$26.50. Which is the better buy?  
a. The 30-lb bag  
b. The 50-lb bag  
c. They are the same.

## Show Your Work

6. A 20-ounce bottle of shampoo costs \$23. What is the price per ounce?
7. Garrett drove 432 miles on 18 gallons of gas. Derick drove 364 miles on 14 gallons of gas. Who had the better gas mileage?

## Explain Your Answer

8. Is the lowest unit price always the best buy? Explain.



## Distance, Rate, and Time Test

### Multiple Choice

- Convert 7.5 feet to inches.
  - 77 inches
  - 85 inches
  - 90 inches
  - 95 inches
- How many hours are in 45 minutes?
  - $\frac{1}{2}$  hour
  - $\frac{2}{3}$  hour
  - $\frac{3}{4}$  hour
  - $\frac{5}{6}$  hour
- Dwayne averaged 65 mph for a 422.5 mile drive. How many hours did he drive?
  - 6
  - 6.3
  - 6.5
  - 7
- Josh walks 3 miles per hour from home to school. The walk takes 25 minutes. How far does Josh live from the school?
  - 1.25 miles
  - 1.5 miles
  - 1.75 miles
  - 2 miles
- Stanley drove a race car an average speed of 120 miles per hour for 3 minutes. How far did Stanley drive the race car?
  - 0.6 miles
  - 3 miles
  - 6 miles
  - 8 miles

### Show Your Work

- Write the distance formula.
- How many minutes are in 2.25 hours?
- If you drive an average of 50 miles per hour for 1.2 hours, how far have you traveled?
- Myles rode 4.5 km per hour. How far did Myles travel in 10 minutes?

### Explain Your Answer

- How many yards per hour is 2 feet per minute? Explain.

# Proportions Test

## Multiple Choice

- A proportion is an equation showing equivalent \_\_\_\_\_.
  - numbers
  - ratios
  - sizes
  - values
- In the proportion  $9 : 7 = 27 : 21$ , the third term is \_\_\_\_\_.
  - 7
  - 9
  - 21
  - 27
- Which of the following is a true proportion?
  - $7 : 15 = 14 : 35$
  - $3 : 5 = 15 : 25$
  - $1 : 3 = 3 : 1$
  - $9 : 12 = 6 : 9$
- Which of the following is NOT a true proportion?
  - $3 : 7 = 6 : 14$
  - $5 : 8 = 15 : 24$
  - $2 : 9 = 12 : 54$
  - $3 : 5 = 6 : 15$
- Which ratio will make this a true proportion?

$$\frac{4}{7} =$$

- 8/15
- 12/21
- 16/40
- 8/21

## Show Your Work

- Write a proportion using the ratio 3 : 10.
- Use cross products to determine if this is a true proportion.

$$\frac{6}{20} = \frac{30}{100}$$

## Explain Your Answer

- What is cross multiplication?

## Solving Proportions Test

### Multiple Choice

1. Find the missing term.

$$\frac{3}{8} = \frac{27}{?}$$

- a. 48      b. 72      c. 102      d. 216

2. Find the missing term.

$$\frac{10}{4} = \frac{?}{66}$$

- a. 44      b. 80      c. 165      d. 264

3. Find the missing term.

$$\frac{?}{36} = \frac{12}{27}$$

- a. 16      b. 18      c. 20      d. 24

4. Amanda makes 3 biscuits in 2 minutes.  
How many biscuits can she make in  
30 minutes?

- a. 20      b. 30      c. 42      d. 45

### Show Your Work

5. Find the missing term.

$$\frac{12}{13} = \frac{?}{52}$$

6. The ratio of boys to girls in Ella's class is 2 to 5. There are 12 boys in Ella's class. How many girls are there?

7. On the assembly line Max can process 15 engines in 40 minutes. How many engines can he process in 2 hours?

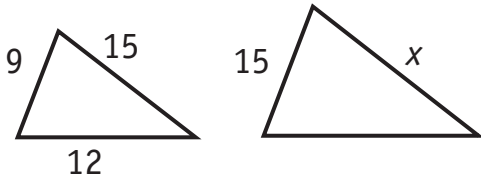
### Explain Your Answer

8. Explain two ways to find a missing value in a proportion.

## Ratios in Geometry Test

### Multiple Choice

- Similar figures \_\_\_\_\_.
  - always have the same size and shape.
  - always have the same size and sometimes the same shape.
  - always have the same shape and sometimes the same size.
  - never have the same size or shape.
- A rectangle is 4 feet long and 6 feet wide. A similar rectangle is 15 feet wide. How long is the similar rectangle?
  - 6 feet
  - 8 feet
  - 10 feet
  - 18 feet
- The triangles are similar. What is the value of  $x$ ?



- 7
  - 18
  - 20
  - 25
- How tall is a tree that casts a 12-foot shadow at the same time as a 5-foot tall person casts a 1-foot shadow?
    - 35 feet
    - 40 feet
    - 60 feet
    - 70 feet

### Show Your Work

- Simplify, then solve the proportion.

$$\frac{32}{40} = \frac{12}{?}$$

- Shawn is holding a yardstick perpendicular to the ground. The yardstick has a shadow that is 30 inches long. A shadow of the tree next to Shawn is 7.5 feet long. How tall is the tree?

### Explain Your Answer

- Two buildings are right next to each other. One is 30 feet tall, and the other is 54 feet tall. One of them casts an 9-foot shadow. Explain how you can find the possible lengths of the other building's shadow.

## Scale Models Test

### Multiple Choice

1. A scale that creates a model that is smaller than the original is called a(n) \_\_\_\_\_.  
a. dilation                      b. enlargement  
c. reduction                      d. rotation
2. A map scale is 2 inches to 30 feet. If a visitor's booth is 195 feet from the entry gate, how far should they be apart on the map?  
a. 1.3 inches                      b. 6.5 inches  
c. 13 inches                      d. 26 inches
3. A scale drawing of a living room has a scale of 1.75 inches = 1.5 feet. How long is a wall that measures 21 inches in the scale drawing?  
a. 24.5 ft   b. 20 ft   c. 18 ft   d. 12.4 ft
4. A painting is enlarged to make a mural at a scale of 10 feet = 3 inches. If a unicorn in the painting has a horn that is 1.8 inches long, how long should it be in the mural?  
a. 3 ft   b. 4 ft   c. 6 ft   d. 8 ft

### Show Your Work

5. Is the scale 1 inch to 2 feet a reduction or an enlargement?
6. A map scale is 1 cm = 20 feet. What should the dimensions on the map be for a building that is 120 feet long and 200 feet wide?
7. A model car has a scale factor of 1 : 48. If the tires on the model car have a diameter of  $\frac{1}{4}$  inch, what is the diameter of a tire on the actual car?

### Explain Your Answer

8. A scale factor is the ratio of the model size to the actual item size. If a map is made where the distance between two cities on the map is 4.5 inches, and the actual distance is 180 miles, how can you find the scale factor?

## Alternate Proportions Test

### Multiple Choice

1. In a proportion, which terms are a pair of corresponding terms?

- a. First and second    b. First and third  
c. Second and third    d. Third and fourth

2. In the proportion  $1 : x = 2 : y$ , which shows a correct alternate proportion?

- a.  $1 : y = 2 : x$         b.  $x : 2 = y : 1$   
c.  $1 : 2 = x : y$         d.  $1 : 2 = y : x$

4. Using the numbers 4, 12, 18, and 54, write four true proportions.

### Explain Your Answer

5. When can an alternate proportion be useful?

### Show Your Work

3. Write the alternate proportion for  $6 : 10 = 9 : 15$  and use cross products to show it is true.

## Percents Test

### Multiple Choice

- 18 is \_\_\_\_\_ of 100.  
a. 9%    b. 12%    c. 18%    d. 36%
- Lyn's class has 100 students, 41 of whom are women. What percent of her class is women?  
a. 12%    b. 41%    c. 59%    d. 69%
- Which ratio is equal to 16%?  
a. 4 : 25    b. 2 : 8    c. 2 : 25    d. 32 : 50
- What percent is equal to the ratio 1 : 4?  
a. 10%    b. 25%    c. 40%    d. 80%

### Show Your Work

- A percent is a ratio that has a second term of \_\_\_\_\_.
- Write 23% as a ratio.

- There are 100 flowers in a shipping crate. Sanam counted 62 roses, 18 lilies, and 20 tulips. What percent of the flowers were roses?
- Write 38% as a ratio in lowest terms.
- Write 210% as a ratio in lowest terms.

### Explain Your Answer

- If you start with \$100, spend \$32, but then return an item and get \$7 back, what percent of your money do you still have? Explain.

## Fractions, Decimals, and Percents Test

### Multiple Choice

1.  $0.13 =$  \_\_\_\_\_  
a. 1.3%    b. 13%    c. 26    d. 130%
2.  $60\% =$  \_\_\_\_\_  
a.  $1/6$     b.  $5/6$     c.  $3/5$     d. 6
3.  $4/5 =$  \_\_\_\_\_  
a. 40%    b. 45%    c. 80%    d. 90%
4. Greg found that 15% of his cats are going to have kittens. What fraction of his cats are going to have kittens?  
a.  $3/20$     b.  $6/20$     c.  $3/50$     d.  $3/25$
7. Hank has 50 marbles. Eight of his marbles are blue. What percent of the marbles are blue?
8. Johnstown Middle School wins 80% of their games. What fraction of their games do they win?
9. In a garden, 45% of the plants are flowers. What fraction of the plants are flowers?

### Show Your Work

5. Write 25% as a fraction and a decimal.
6. Write 62% as a fraction and a decimal.

### Explain Your Answer

10. Explain how to convert from a percent to a decimal.



## Percents and Proportions Test

### Multiple Choice

1. What percent of 20 is 16?  
a. 25%    b. 65%    c. 75%    d. 80%
2. 12% of what is 30?  
a. 36    b. 160    c. 250    d. 280
3. What is 35% of 140?  
a. 35    b. 49    c. 70    d. 86
4. How much will you save if you buy a book that is 25% off of \$21.00?  
a. \$3.75    b. \$4.25    c. \$4.50    d. \$5.25
5. Marty had 25 tomatoes and gave 36% of them to his neighbor. How many tomatoes did he give his neighbor?  
a. 9    b. 11    c. 12    d. 18

7. 24% of \_\_\_\_\_ is 372.

8. In an election, 350 people voted for Prom Queen. Chandra got 58% of the votes. How many votes did Chandra get?

### Explain Your Answer

9. This table shows the height and number of baskets made for a high school basketball team. What percent of the baskets were made by players less than 5'8" tall? Explain.

Height	Baskets scored
5'4"	5
5'6"	2
6'2"	8
6'	10
5'11"	3
5'10"	7
6'1"	4
5'7"	14
5'10"	11
6'1"	20

### Show Your Work

6. What is 72% of 350?

## Percent Equation Test

### Multiple Choice

1. What is 10% of 142?  
a. 142      b. 71      c. 42.4      d. 14.2
2. What is 50% of 36?  
a. 18      b. 27      c. 36      d. 54
3. Guy was given a 15% golf membership discount off of his total bill of \$720. How much was his discount?  
a. \$18      b. \$96      c. \$108      d. \$126
4. School taxes in Ben's district are  $\frac{3}{4}\%$  of his income. If Ben made \$72,840 this year, how much will his school taxes be?  
a. \$485.60      b. \$546.30  
c. \$971.20      d. \$5463.00
5. Brittany works at the zoo and 31.25% of her 16 otters are sick. How many are sick?  
a. 3      b. 4      c. 5      d. 7 2

### Show Your Work

6. Write the percent equation in words.
7. What is 11.5% of 20?
8. What is  $\frac{1}{2}\%$  of 48?
9. A jacket originally cost \$96. It is marked at 30% off. How much is the discount?

### Explain Your Answer

10. Pat has a coupon for 40% off the entire bill at a local restaurant. Her bill was \$54.50. Explain how you can find what her new bill is after the discount.

## Percents over 100% Test

### Multiple Choice

- Find 200% of 32.  
a. 16      b. 16      c. 64      d. 128
- Find 120% of 90.  
a. 18      b. 98      c. 108      d. 180
- A loaf of bread has risen to 1200% of its price over Francis' lifetime. When she was born, a loaf cost \$0.16. What is 1200% of \$0.16?  
a. \$0.92    b. \$1.92    c. \$2.18    d. \$2.46
- This year the elementary school has 175% the number of students as they did last year. Last year there were 300 students. How many are there this year?  
a. 225      b. 475      c. 525      d. 575
- Yosh spent 18 hours in the gym last week. His goal was to spend 12 hours in the gym. What percent of his goal did he meet?  
a. 50%      b. 150%      c. 160%      d. 180%

### Show Your Work

- Find 250% of 800.
- A store marks their clothing up to 350% of their cost. If a skirt costs the store \$12, how much are they going to put on its price tag?

### Explain Your Answer

- Jack says 600% of 27 is 16.2. How can you tell quickly that is answer is not correct?

## Finding a Percentage Test

### Multiple Choice

1. What percent of 50 is 35?  
a. 35%    b. 50%    c. 70%    d. 75%
2. What percent is 11 out of 25?  
a. 44%    b. 60%    c. 70%    d. 88%
3. What percent of 80 is 120?  
a. 15%    b. 67%    c. 96%    d. 150%
4. Jenna counted 28 out of 32 students wearing jeans. What percent of the students were wearing jeans?  
a. 68.7%    b. 87.5%    c. 90.6%    d. 92%
5. Tim opened a bag of gummy bears and found that 36 out of 40 were red. What percent of the gummy bears were red?  
a. 75%    b. 80%    c. 85%    d. 90%
6. Cassie is reading a book with 1,460 pages. She is on page 822. About what percent of the book does she have left to read?  
a. 36%    b. 44%    c. 48%    d. 56%

### Show Your Work

7. What percent is 24 out of 25?
8. Rebecca's mother was one of 14 children. Ten of the children had brown eyes. About what percent of the children had brown eyes?

### Explain Your Answer

9. Brian used a calculator to find what percent 12 is out of 40. His answer was 0.3%. What did Brian do wrong?

## Finding a Whole Test

### Multiple Choice

- 20% of \_\_\_\_\_ is 60.  
a. 3      b. 34      c. 120      d. 300
- 14% of \_\_\_\_\_ is 140.  
a. 100      b. 280      c. 1,000      d. 1,400
- 5.5% of \_\_\_\_\_ is 11.  
a. 22      b. 110      c. 200      d. 220
- A librarian estimated that 60% of the books in the local library were fiction. She counted 8,556 fiction books. About how many of books are in the local library?  
a. 16,842      b. 14,260  
c. 10,250      d. 8,556
- About 80% of the packages on a delivery truck are internet orders. The driver delivered 644 packages that were internet orders. About how many total packages did the driver deliver that day?  
a. 805      b. 894      c. 966      d. 1,002

### Show Your Work

- 48% of \_\_\_\_\_ is 12.
- Forty percent of Kylie's classmates have piercings. If 14 of her classmates have piercings, how many students are in her class?

### Explain Your Answer

- Gibby solved 16% of \_\_\_\_\_ is 40 with an answer of 250. Explain how to check Gibby's answer.

## Percent of Change Test

### Multiple Choice

- The percent of change when a new value is larger than the original value is called a percent of \_\_\_\_\_.  
a. change            b. decrease  
c. increase        d. interest
- Last month Sharon's electric bill was \$162. This month, her bill is \$100. About what is the percent of decrease?  
a. 38%    b. 48%    c. 62%    d. 162%
- Last year Billy averaged 36 hours of work per week. This year, he's averaging 44 hours of work a week. About what is the percent of increase?  
a. 18%            b. 22%  
c. 45%            d. 82%
- The number of calories Brant consumes per day increased by 30% when he went to college. He was averaging 1,800 calories a day before he left. About how many calories a day is he consuming at college?  
a. 540    b. 1,260    c. 2,180    d. 2,340

### Show Your Work

- Wayne weighed 320 pounds and has lost 180 pounds. What is the percent of decrease in Wayne's weight?
- Akshat spent 3 hours each day driving to and from work. He opened an office closer to home, and now drives 80 minutes to and from work. What is the percent of decrease in his commute time?

### Explain Your Answer

- The rate for renting a paddle boat increased to 150% of its original cost, \$20. Is 150% the percent of change? Explain.

## Sales Tax and Discounts Test

### Multiple Choice

- How much is 7.5% sales tax on \$80.00?  
a. \$6.00 b. \$5.40 c. \$5.20 d. \$4.80
- A car stereo that regularly sells for \$109 is on sale at a 15% discount. What is the sale price?  
a. \$16.35 b. \$84.50 c. \$92.65 d. \$125.35
- A bike that is regularly priced at \$159 has a 25% discount. How much is the discount?  
a. \$39.75 b. \$89.50 c. \$119.25 d. \$124.25
- Orenda bought \$36 in school supplies. With a 6% sales tax, what was her total?  
a. \$2.16 b. \$8.16 c. \$38.16 d. \$40.36
- A bedding set that regularly sells for \$86 is on sale with a 20% discount. How much will the total sale be including a 5% sales tax?  
a. \$68.80 b. \$72.24 c. \$73.10 d. \$90.30

### Show Your Work

- Sami bought a jacket regularly priced \$130 at a 40% discount. How much did the jacket cost before sales tax?
- Adra bought a book for \$26. Sales tax is 8%. What was Adra's total?

### Explain Your Answer

- Molly wants to buy a pair of boots that were originally \$60. They are on sale for 30% off. At the register, the cashier tells her there is an additional 25% off the sale price. Explain what the boots will cost Molly.

## Tips Test

### Multiple Choice

1. The total bill for a restaurant meal is \$46. How much will the waiter get if you give a 10% tip?  
**a. \$4.00   b. \$4.60   c. \$5.00   d. \$9.00**
2. At a buffet, the waiter has less to do, so many people leave a smaller tip. If you spent \$80 at a buffet, and wanted to leave a 5% tip, how much should you leave?  
**a. \$4.00   b. \$4.50   c. \$6.00   d. \$8.00**
3. A taxi driver carried your luggage in the rain for you, then waited an extra 20 minutes with you until you found your keys. The taxi ride was \$22.50. You want to give at least a 20% tip. What is a good amount to pay the driver in all?  
**a. \$23.00                      b. \$25.00**  
**c. \$30.00                      d. \$50.00**
4. A children's haircut costs \$8.75. If you leave about a 15% tip, what is a good amount to pay in total?  
**a. \$9.00   b. \$10.00   c. \$12.00   d. \$15.00**

### Show Your Work

5. What are 10%, 15%, and 20% of \$30?
6. You're having a birthday party at a restaurant and leave a mess at the table. You want to give the hostess a good tip of 25%. If the party meal cost you \$120, how much should you tip the hostess?

### Explain Your Answer

7. How can you mentally find 5% of any amount?



# Simple Interest Test

## Multiple Choice

- \_\_\_\_\_ means twice a year.  
a. Annual                      b. Biannual  
c. Quarterly                  d. Semiannual
- What is the simple interest on a \$2,000 loan over 2 years at 5%?  
a. \$20    b. \$100    c. \$200    d. \$500
- What is the simple interest on a loan of \$3,500 at 3.5% over 5 years?  
a. \$61.25                      b. \$122.50  
c. \$245.00                    d. \$612.50
- How much will you have to pay back in total if you borrow \$400 for 1 year at 12%?  
a. \$48    b. \$96    c. \$412    d. \$448
- What is the repayment amount after one month on a simple interest loan of \$2,500 at 7% interest?  
a. \$14.58                      b. \$2,514.58  
c. \$2,587.58                  d. \$2,675.00

## Show Your Work

- What is the simple interest on a \$1,200 over 2 years at 5.5% interest?
- A credit card charges an annual interest rate of 23.5%. If you borrow \$200, what is the interest for three months?
- What is the total amount due after 6 months on an initial loan of \$1,400 at 12.5% interest?

## Explain Your Answer

- How can you find the amount of simple interest that is paid after 45 days?

## Answers

### Ratios Test

**Page 2:** 1. d 2. c 3. a 4. d 5. c 6. 11 to 15 7. 8 to 18 8. Add all of the pizzas, there are  $4 + 4 + 2 = 10$ . Use any one of the specific kinds of pizza and compare it to the total. For example, pepperoni to total pizzas is 4 to 10.

### Equivalent Ratios Test

**Page 3:** 1. c 2. b 3. d 4. a 5. a 6. Answer may vary, possible answers: 2 to 10, 3 to 15, 4 to 20. 7.  $3 : 9$  8. If someone wants to know the total number of tickets sold, the actual numbers are needed.

### Reducing Ratios Test

**Page 4:** 1. a 2. c 3. c 4. a 5. d 6. 4 7. The ratio of rabbits to chickens is 1 to 2. 8. No, the ratio can be reduced farther. 9 and 27 both have a factor of 9. In lowest terms,  $27 : 81$  is  $1 : 3$ .

### Rates Test

**Page 5:** 1. b 2. d 3. c 4. b 5. d 6. \$15 per belt 7. \$8 per hour 8. If Teri makes 8 bracelets in 6 hours, the rate is 8 bracelets per 6 hours. Both 8 and 6 are divisible by 2. In lowest terms, Teri can make 4 bracelets per 3 hours.

### Ratios, Fractions, and Decimals Test

**Page 6:** 1. d 2. c 3. d 4. d 5. b 6. d 7. 2,360 8. 27 to 4 9. 48 10. Possible answer: You can change the ratio 1.4 to 8 to a whole number ratio in two steps. First multiply both terms by 10 to get rid of the decimal point, 14 to 80. Now, both terms are divisible by 2, so divide each by 2. 7 to 40. This is the whole number ratio in lowest terms.

### Unit Rates Test

**Page 7:** 1. c 2. a 3. b 4. b 5. b 6. Dante's fuel mileage is 25 miles per gallon. 7. \$8.75 per hour 8. \$180 per hour 9. There are 60 minutes in each hour. If Gina can type 65 words in one minute, multiply that by 60. She can type 3,900 words in 60 minutes, or 3,900 words per hour.

### The Better Buy Test

**Page 8:** 1. a 2. a 3. b 4. d 5. a 6. \$1.15 per ounce 7. Derick had better gas mileage. 8. There may be times when the lowest unit price is not the better buy. For example, if the prices are close, but you have to drive farther to get the lower price, or if you have to buy more to get the price, but you won't use extra.

### **Distance, Rate, and Time Test**

**Page 9:** 1. c 2. c 3. c 4. a 5. c 6. distance = speed  $\times$  time 7. 135 8. 60 miles 9. Myles traveled 0.75 km in 10 minutes. 10. Possible answer: This can be done in two steps. First change the minutes to hours. 2 feet per minute is 120 feet per hour. Then change the feet to yards. 120 feet per hour is 40 yards per hour. So, 2 feet per minute is 40 yards per hour.

### **Proportions Test**

**Page 10:** 1. b 2. d 3. b 4. d 5. b 6. Answers will vary, some possible second ratios are 6 : 20, 9 : 30, 30 : 100. 7.  $(6)(100) = (20)(30)$ .  $600 = 600$ . It is true. 8. Cross multiplication is when you multiply the first and fourth terms and the second and third terms in a proportion, like in the shape of an X. The products will be equal if the proportion is true.

### **Solving Proportions Test**

**Page 11:** 1. b 2. c 3. a 4. d 5. 48 6. There are 30 girls in Ella's class. 7. Max can process 45 engines in 2 hours. 8. You can use cross multiplication. Multiply the two terms that you know, then divide by the term that is by itself to find the missing term. Or, you can find a factor that relates the two ratios. For instance, if the proportion is  $1 : 2 = 3 : ?$ , it is easy to see that you can multiply the second term by 3 to get the fourth term.

### **Ratios in Geometry Test**

**Page 12:** 1. c 2. c 3. d 4. c 5. 15 6. The tree is 9 feet tall. 7. There are two possible shadow lengths. Set up two proportions. In one, set the shadow you know as the shadow of the shorter building. In the other, set it as the shadow of the taller building. The shadow of the other building is either 5 or 16.2 feet long.

### **Scale Models Test**

**Page 13:** 1. c 2. c 3. c 4. c 5. A reduction. 6. The building should be 6 cm long and 10 cm wide on the map. 7. The diameter of the tire is 12 inches. 8. Set up a ratio of the model to the actual, 4.5 in to 180 miles. Make it a whole number ratio by multiplying both terms by 10. 45 inches to 1,800 miles. Now divide both by 45. The scale factor is 1 inch to 40 miles.

### **Alternate Proportions Test**

**Page 14:** 1. b 2. c 3.  $6 : 9 = 10 : 15$ :  $(6)(15) = (9)(10)$ .  $90 = 90$  4.  $4 : 12 = 18 : 54$ ,  $4 : 18 = 12 : 54$ ,  $12 : 4 = 54 : 18$ ,  $18 : 4 = 54 : 12$  5. An alternate proportion can be useful when you need to find a missing term and the alternate terms are easier to find a multiplier for. For example, in the proportion  $2 : 6 = 3 : ?$ , it may be easier to see the alternate proportion  $2 : 3 = 6 : ?$  can be solved by multiplying 3 by 3 for a missing term of 9.

### **Percents Test**

**Page 15:** 1. c 2. b 3. a 4. b 5. 100 6.  $23 : 100$  7. 62% of the flowers were roses. 8.  $19 : 50$  9.  $21 : 10$  10. If you spend \$32, but have \$7 returned, then you have only spent \$25. If \$25 out of \$100 is spent, then \$75 remain. \$75 of \$100 is 75%.

### **Fractions, Decimals, and Percents Test**

**Page 16:** 1. b 2. c 3. c 4. a 5.  $1/4$ , 0.25 6.  $31/50$ , 0.62 7. 16% of Hank's marbles are blue. 8. Johnstown Middle school wins  $4/5$  of their games. 9.  $9/20$  of the plants are flowers. 10. You can convert from a percent to a decimal just by moving the decimal point two places left and dropping the percent sign.

### **Percents and Proportions Test**

**Page 17:** 1. d 2. c 3. b 4. d 5. a 6. 252 7. 1,550 8. Chandra got 203 votes. 9. To find the percent, you must know the part and the whole. There were 84 baskets scored in all. 21 of the baskets were made by players less than 5'8" tall.  $21/84$  is 25%. So, 25% of the baskets were made by players less than 5'8".

### **Percent Equation Test**

**Page 18:** 1. d 2. a 3. c 4. b 5. c 6. Percent of part is whole. 7. 2.3 8. 0.24 9. \$28.80 10. One way to find the new bill is to understand that if the coupon is for 40%, then 60% is what still must be paid. 60% of \$54.50 is \$32.70.

### **Percents over 100% Test**

**Page 19:** 1. c 2. c 3. b 4. c 5. b 6. 2,000 7. The skirt will be marked \$42.00. 8. When a percentage is greater than 100%, the part will always be greater than the whole. 16.2 is not greater than 27, so it is not correct.

### **Finding a Percentage Test**

**Page 20:** 1. c 2. a 3. d 4. b 5. d 6. b 7. 96% 8. About 71% of the children had brown eyes. 9. Brian did not change the decimal into a percent. His answer is correct if he moves the decimal point two places right to 30%.

### **Finding a Whole Test**

**Page 21:** 1. d 2. c 3. c 4. b 5. a 6. 25 7. There are 35 students in Kylie's class. 8. Use multiplication to check Gibby's answer.  $16\% \times 250 = 40$ ,  $0.16(250) = 40$ ,  $40 = 40$ .

### **Percent of Change Test**

**Page 22:** 1. c 2. a 3. b 4. d 5. There is a 56.25% of decrease in Wayne's weight. 6. There is about a 56% decrease in Akshat's commute time. 7. The rate for renting a paddle boat increased 150% from \$20 to \$30. The percent of increase is found by taking the difference, \$10, and dividing that by the original cost, \$20. The percent of increase is 50%, not 150%.

### **Sales Tax and Discounts Test**

**Page 23:** 1. a 2. c 3. a 4. c 5. b 6. Before sales tax the jacket cost \$78. 7. Adra's total was \$28.08. 8. The second discount is off of the sale price, not the original price, so you must take a discount two times. First is a 30% discount, so the originally \$60 boots are \$18 off, or \$42. Then you can take another 25% off of the \$42. This is \$10.50 more. The boots will cost Molly \$31.50.

### **Tips Test**

**Page 24:** 1. b 2. a 3. c 4. b 5. 10% is \$3.00, 15% is \$4.50, and 20% is \$6.00. 6. At 25%, you should tip the hostess \$30. 7. You can find 5% of any amount mentally by moving the decimal point in the amount one place left, then taking half of the result. For example, 5% of 60. Find 10% by moving the decimal point. 10% of 60 is 6, so 5% of 60 is 3.

### **Simple Interest Test**

**Page 25:** 1. d 2. c 3. d 4. d 5. b 6. \$132 7. \$11.75 8. \$1,487.50 9. The simple interest formula uses principal  $\times$  rate  $\times$  time, where 1 unit of time is equal to 1 year. For a loan over 45 days, use the fraction  $45/365$  as the time, since there are 365 days in a year.