



Math OER

Shapeshifting Test

Name:

Date:

*Reduce fraction answers. No need to change improper fraction answers to mixed numerals.
Show numbered step-by-step answers for partial credit!*

1. Which decimal is bigger, 0.8458 or 0.8359?
2. Round 7987.7987 to the nearest tenth.
3. Estimate the division problem $248 \div 47.1$ by rounding both numbers to the nearest tens place.
4. Susan has 3 partial skeins of yarn, all $\frac{1}{4}$ of new skeins of the same initial length. She wants to make a striped *Dr. Who* style scarf, with each stripe requiring $\frac{1}{24}$ of a new skein. How many stripes can she make?
5. How many factors does 104 have?
6. Find the prime factorization of 2,058.
7. What is the greatest common factor of 84 and 36?
8. Reduce the fraction $\frac{12}{42}$
9. Reduce the fraction $\frac{3.6}{38}$
10. Write the fraction $\frac{2}{10}$ as a decimal.
11. Brand A costs \$26.28 for 13 ounces. Brand B costs \$20.75 for 11 ounces. What is the price per ounce for each? Which is the better buy?
12. Stalwart the Wonder Snail crawls 34 yards in 11.1 minutes. How many yards would it crawl in 71 minutes? (Hint: As a first step, find the unit rate of yards per *one* minute.)
13. Superbia City has a population of 798,700 people and an area of 5.2 square miles. Find its population density in people per square mile.
14. Simplify: $8,086.471 \div 10$
15. Simplify: $7,888.372 \div 0.001$
16. When changing 99% into decimal format, is it most efficient to replace the % symbol with *two decimal scoots to the left*?

17. Write 599.471% in decimal format.
18. Write 250.47 in percent format.
19. Write the fraction $\frac{5}{25}$ in percent format.
20. Write $6\frac{2}{5}\%$ in fraction format.
21. How many milliliters are in 99.471 cubic centimeters?
22. The tallest skyscraper in Superbia City is 570 meters tall. How many feet is this? (1 meter is about 3.281 feet.)
23. Coffee-lover Chuck drinks 21 cups of coffee each day. How many pints is this each day?
24. Two mad scientists are chatting. One brags that his opti-maximer has a length of 121 kilometers. The other mentally changes this amount into miles. How many miles is it? (There are about 1.61 kilometers in a meter.)
25. The average distance between Moondoes Coffee Shops is 7,987 meters. How many millimeters is this? Do not round your answer.
26. A box weighs 471,087 centigrams. How many kilograms is this? Do not round your answer.
27. A crate has a length of 487.471 kilometers. How many meters is this? Do not round your answer.
28. What is the square root of 10,201?

show answers

1. the first number, **0.8458**
2. **7987.8**
3. $250 \div 50 = 5$
4. Each partial skein can make 6 stripes, and there are 3 skeins. Multiply to get **18 stripes**.
5. There are **8** factors: 1, 104, 2, 52, 4, 26, 8, 13
6. The prime factorization is $2 \times 3 \times 7 \times 7 \times 7$.
7. The greatest common factor is **12**.
8. Divide both top and bottom by 6 to get $\frac{2}{7}$
9. First multiply both top and bottom by 10 to get $\frac{36}{380}$. Then divide both top and bottom by 4 to get $\frac{9}{95}$
10. Do "top \div bottom" to get **0.2**.
11. Brand A costs \$2.02 per ounce. Brand B costs \$1.89 per ounce. **Brand B** is the better buy.
12. The unit rate is about $34 \div 11.1 \approx 3.1$ yards per minute. So in 71 minutes, the snail would go about **217.5 yards**.

Alternately, write a proportion as $\frac{34 \text{ yards}}{11.1 \text{ minutes}} = \frac{z \text{ yards}}{71 \text{ minutes}}$. We solve for z and round to the nearest tenth of a yard to get **217.5 yards**.

13. Rounding to the nearest whole number gives us **153,596 people per square mile**.

14. 1 scoot to the left gives an answer of **808.6471**

Note: The previous problem is sometimes displayed wrong due to floating point arithmetic.

15. 3 scoots to the right gives an answer of **7,888,372**

Note: The two previous problems are sometimes displayed wrong due to floating point arithmetic.

16. Yes.

17. Use RIP LOP and scoot the decimal point twice to the left to get **5.99471**

18. Use RIP LOP and scoot the decimal point twice to the right to get **25,047%**

19. First change the fraction into a decimal by using $\text{top} \div \text{bottom}$ to get 0.2, then use RIP LOP and scoot the decimal point twice to the right to get **20%**

20. First change the mixed number into an improper fraction, still in percent format: $\frac{32}{5}\%$. Then replace the % symbol with $\times \frac{1}{100}$ and multiply. The result is

$\frac{32}{500}$. Reduce if necessary. The answer is $\frac{8}{125}$.

21. A milliliter is a cubic centimeter, so the answer is **99.471 milliliters**.

22. There are about 3.281 feet in one meter. So 570 meters is about equal to $570 \times 3.281 \approx$ **1,870 feet**.

23. There are 2 cups in one pint. So 21 cups is equal to **10.5 pints**.

24. About **75.2 miles**.

25. There are 1,000 millimeters in one meter. So 7,987 meters is equal to **7,987,000 millimeters**.

26. There are 100 centigrams in one gram, and there are 1,000 grams in one kilogram. Together those mean there are 100,000 centigrams in one kilogram. So 471,087 centigrams is equal to **4.71087 kilograms**.

27. The *K-H-D-U-D-C-M-x-x-micro* shortcut from converting kilometers into meters is to scoot the decimal point 3 places to the right. So the answer is **487,471 meters**.

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28. The calculator does the work for us. The answer is **101**.