

Dividing and Multiplying by Powers of 10

• Example 1

How many meters are in 2.45 kilometers?

Solution

$$2.45 \times 1000 = 2450. = 2450$$

To multiply a decimal number by 1000, move the decimal point 3 places to the right. This involves adding a zero.

There are 2450 meters in 2.45 kilometers.

If the result is a whole number, there is no need to write the decimal point.

● ● ● CHECK YOURSELF 1

$$5.23 \times 1000$$

• Example 2

How many meters does 3450 millimeters make?

Solution

$$\frac{3450}{1000} = 3.45$$

To divide a number by 1000, move the decimal point three places to the left. In the example, the decimal point is implicit, to the right of the zero: $3450 = 3450.$ Moving the decimal point three places and dropping the zero gives 3.45.

3450 millimeters makes 3.45 meters.

● ● ● CHECK YOURSELF 2

$$658 \div 1000 =$$

● ● ● CHECK YOURSELF ANSWERS

1. 5230. 2. 0.658.
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3.9 Exercises

Name _____

Section _____

Date _____

A N S W E R S

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Multiply.

1. 5.89×10

2. 0.895×100

3. 23.79×100

4. 2.41×10

5. 0.045×10

6. 5.8×100

7. 0.431×100

8. 0.025×10

9. 0.471×100

10. $0.95 \times 10,000$

11. 0.7125×1000

12. 23.42×1000

Solve the following applications.

13. **Cost.** A store purchases 100 items at a cost of \$1.38 each. Find the total cost of the order.

14. **Conversion.** To convert from meters to centimeters, multiply by 100. How many centimeters are there in 5.3 meters?

15. **Conversion.** How many grams are there in 2.2 kilograms? Multiply by 1000 to make the conversion.

16. **Cost.** An office purchases 1000 pens at a cost of 17.8 cents each. What is the cost of the purchase in dollars?

Divide.

17. $5.8 \div 10$

18. $5.1 \div 10$

19. $4.568 \div 100$

20. $3.817 \div 100$

21. $24.39 \div 1000$

22. $8.41 \div 100$

23. $6.9 \div 1000$

24. $7.2 \div 1000$

Solve the following applications.

25. **Construction.** The cost of a street-lighting project, \$4850, will be shared by 10 homeowners in a neighborhood. What will each homeowner pay?

26. **Construction.** A road-paving project will cost \$23,500. If the cost is to be shared by 100 families, how much will each family pay?

27. **Conversion.** To convert from milligrams to grams, we divide by 1000. A tablet weighs 250 mg. What is its weight in grams?

28. **Conversion.** To convert from milliliters to liters, we divide by 1000. If a bottle of wine holds 750 mL, what is its volume in liters?

29. **Unit cost.** A shipment of 100 calculators cost a store \$593.88. Find the cost per calculator (to the nearest cent).

30. **Unit cost.** A shipment of 1000 writing tablets cost an office supplier \$756.80. Find the cost per tablet (to the nearest cent).

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