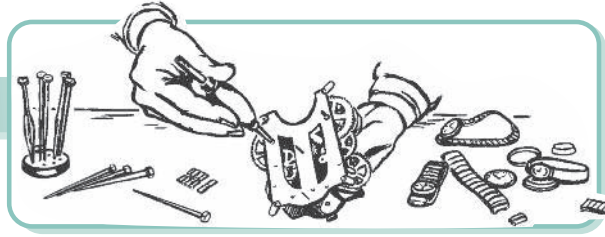


# Lesson

# 1



## Solving Equations With Fractional Coefficients

Some equations include a variable with a fractional coefficient. Solve this kind of equation by multiplying both sides of the equation by the reciprocal of the fraction and canceling factors.



The problem  $\frac{2}{3}x = 32$  is the same as  $\frac{2x}{3} = 32$ .

To solve this problem, first multiply both sides by 3 which yields  $2x = 96$ . Then divide both sides by 2 for the solution  $x = 48$ . Today's lesson combines both these steps into one by using the reciprocal  $\frac{3}{2}$ .

$$\frac{2}{3}x = 32$$

$$\frac{3}{2} \cdot \frac{2}{3}x = 32 \cdot \frac{3}{2}$$

Multiply both sides by the reciprocal of  $\frac{2}{3}$ .

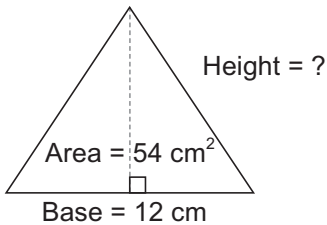
$$\frac{\cancel{3}}{\cancel{2}} \cdot \frac{\cancel{2}}{\cancel{3}}x = \cancel{3}2 \cdot \frac{3}{\cancel{2}}$$

Cancel factors and multiply.

$$x = 48$$

Solution.

The next two examples show how you can use this algebra skill to find the missing dimension for either a triangle or a trapezoid.



$$A = \frac{1}{2}bh$$

$$54 = \frac{1}{2}(12h)$$

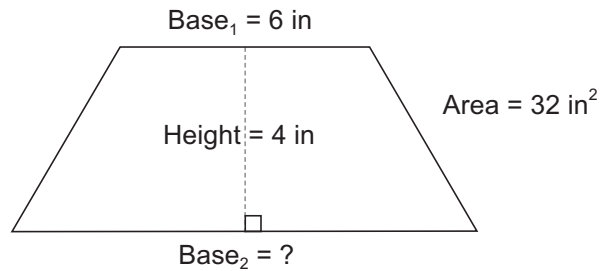
$$\frac{2}{1} \cdot 54 = \frac{2}{1} \cdot \frac{1}{2}(12h)$$

$$\frac{108}{12} = \frac{12h}{12}$$

$$9 = h$$

The height of the triangle is 9 cm.

Multiplying both sides by  $2(\frac{2}{1})$  cancels  $\frac{1}{2}$ .



$$A = \frac{1}{2}(b_1 + b_2)h$$

$$32 = \frac{1}{2}(6 + b_2)4$$

$$\frac{2}{1} \cdot 32 = \frac{2}{1} \cdot \frac{1}{2}(6 + b_2)4$$

$$64 = (6 + b_2)4$$

$$64 = 24 + 4b_2$$

$$\begin{array}{r} -24 \\ -24 \end{array}$$

$$\frac{40}{4} = \frac{4b_2}{4}$$

$$10 = b_2$$

The length of base<sub>2</sub> is 10 inches.

Use the distributive property to simplify.

Solve.

1. a.  $\frac{1}{2}x = 8$

b.  $\frac{1}{6}x = 20$

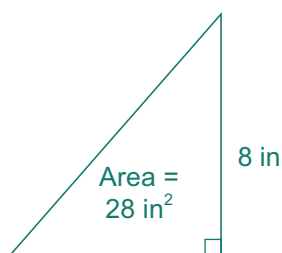
c.  $\frac{3}{4}x = 48$

2. a.  $\frac{2}{5}x = 12$

b.  $\frac{2}{3}x = 30$

c.  $\frac{3}{4}x = 9$

Find the length of the base.



3. The base of the triangle is \_\_\_\_\_.



## We Remember



4. Two exit signs at The Clockworks are illuminated all the time.



Each sign contains a 25-watt bulb. At 8.6 cents per kilowatt-hour, how much does it cost to light both signs for a week?

Round to the nearest whole cent. \_\_\_\_\_

$$\frac{w \times h}{1,000} = \text{kwh}$$



Convert. Round No. 5 to the nearest tenth.

5. 1,000 fluid ounces  $\approx$  \_\_\_\_\_ gallons6. 5 yards<sup>3</sup> = \_\_\_\_\_ feet<sup>3</sup>

Combine like terms.

7. a.  $5a - 3b + 8b - c - 6a$

b.  $5x^3 - 8x^2 - 2x + 4x^3$

c.  $\frac{-2x^2 - 3x + 4}{-x^2 + 2x}$

# Lesson 1

Fill in the chart to show what to say to count back change without a cash register.

Amount of purchase	1¢	5¢	10¢	25¢	\$1	\$5	Customer gave
8. \$0.28							\$1.00
9. \$3.22							\$10.00

**10.** Sue applied three layers of finish to a clock case Carl had built. On Monday she worked 1 hour and 55 minutes, on Wednesday she applied the second coat in 2 hours and 20 minutes, and on Friday it took her 2 hours and 35 minutes to put on the final coat. How much time did it take Sue to finish the clock case? \_\_\_\_\_

Write the products. Use fractions for those with negative exponents.

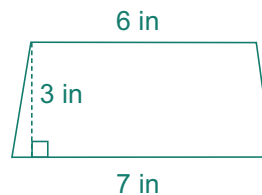
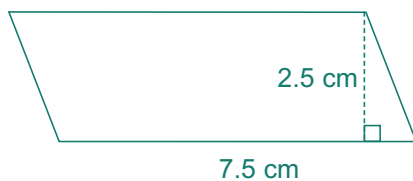
11. a.  $b^0 =$  \_\_\_\_\_      b.  $y^1 =$  \_\_\_\_\_      c.  $4^{-2} =$  \_\_\_\_\_      d.  $15^{-2} =$  \_\_\_\_\_

Solve. Round to the nearest cent.

12. Original price of \$15 with an increase of 8%.  
 a. Amount of increase: \_\_\_\_\_  
 b. New price: \_\_\_\_\_
13. The price went down 90% from \$90.20.  
 New price: \_\_\_\_\_

**14.** Last month The Clockworks sold clocks with the following prices: \$285.99, \$215.99, \$148.99, \$521.99, \$338.99, and \$575.99. What was the average cost per clock? \_\_\_\_\_

Use the formulas to find the areas of the parallelogram and the trapezoid.



15. a. \_\_\_\_\_      b. \_\_\_\_\_

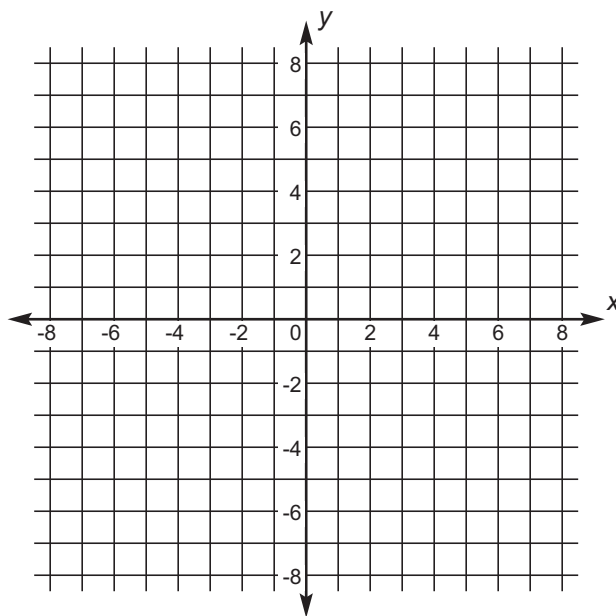
## Mastery Drill

16. Any number except 0 with an exponent of 0 equals \_\_\_\_\_.
17. The longest side of a right triangle is called the \_\_\_\_\_.
18. Numbers in an expression that stand alone without variables are called \_\_\_\_\_.
19. a. Another name for *average* is \_\_\_\_\_.      b. 1 kilometer  $\approx$  \_\_\_\_\_ mile
20. a.  $\frac{5}{8} =$  \_\_\_\_\_%      b.  $\sqrt{196} =$  \_\_\_\_\_      c.  $5^3 =$  \_\_\_\_\_      d.  $2^3 =$  \_\_\_\_\_

Complete the table and graph the equation.

21.  $\frac{x}{-6} - 3 = y$

x	y
0	
6	
-6	



Find the distance between points.

22. From  $(-6, 3)$  to  $(6, -2)$  is \_\_\_\_\_ units.

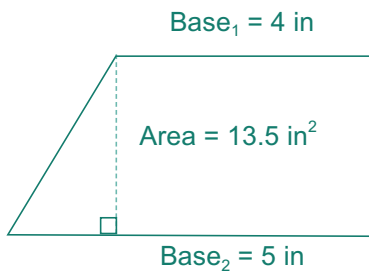
23. Carl ordered a triple-chime clock movement for a grandfather clock he is building. The clock movement costs \$538.99. If the clock movement represents 40% of the value of the finished clock, what will this clock be worth? Use the percent proportion, and round to the nearest whole dollar. \_\_\_\_\_

Change to scientific notation.

24. a.  $39,000,000 =$  \_\_\_\_\_      b.  $0.0000369 =$  \_\_\_\_\_

## Lessons 1, 2

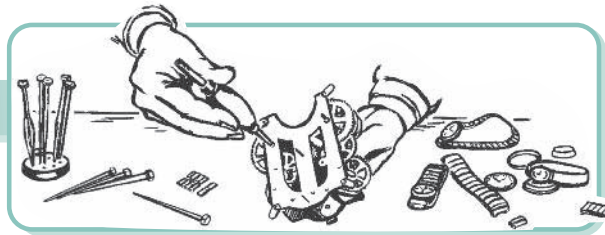
Find the height of the trapezoid.



25. The height of the trapezoid is \_\_\_\_\_.

## Lesson

# 2



## Constructing a Triangle With Two Given Angles and a Given Side (ASA)

You can use a compass and a straightedge to construct a triangle with two given angles and the side between them.

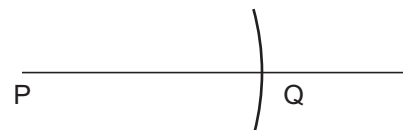
These are the given angles:



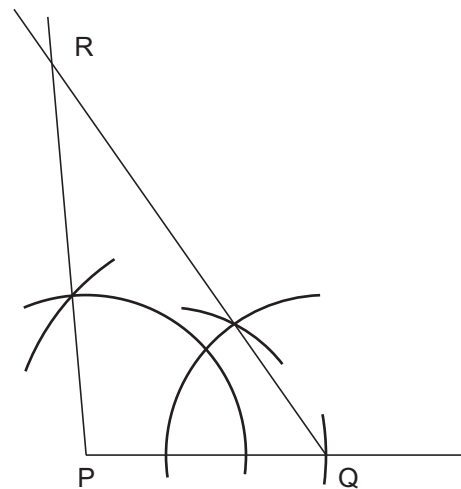
This is the side between the two angles:



- With the straightedge, draw a segment that is longer than PQ. Label one endpoint P and use the compass to mark the length of PQ with an arc. Label the point of intersection Q.

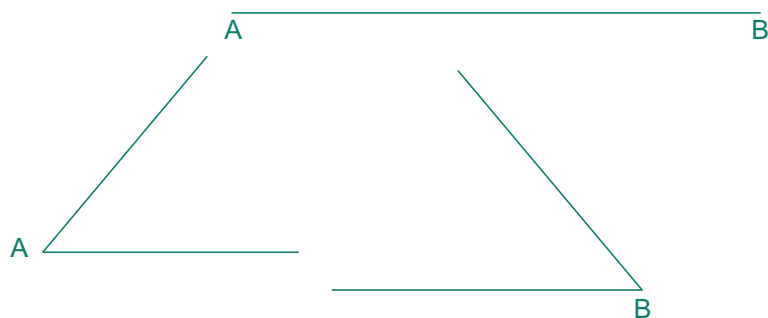


- With the compass and straightedge, construct angles equal to  $\angle P$  and  $\angle Q$ . Extend the segments so they intersect. Name the point of intersection R. Note: You learned how to construct congruent angles in Math 804, Lesson 2.

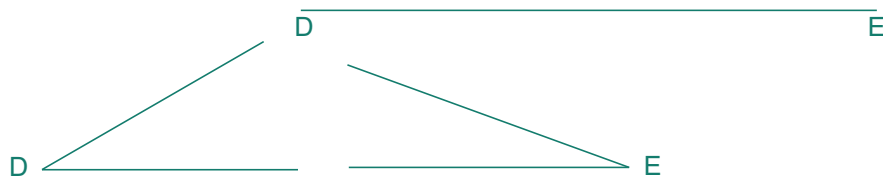


Use a compass and a straightedge to construct  $\triangle ABC$  and  $\triangle DEF$  from the parts given.

$\triangle 1.$



$\triangle 2.$



*We Remember*

Solve.

3. a.  $\frac{1}{7}x = 12$

b.  $\frac{2}{3}x = 42$

c.  $\frac{7}{8}x = 14$

4. a.  $\frac{3}{8}x = 15$

b.  $\frac{3}{7}x = 21$

c.  $\frac{1}{8}x = 13$

## Lesson 2

Write  $a$  as dollars and  $b$  as cents.

5. a. 91.2 cents = \_\_\_\_\_

b. \$0.287 = \_\_\_\_\_

Find the markup and selling price. Round to the nearest cent.

6. The cost was \$1.43 marked up 35%.

a. The markup is \_\_\_\_\_.

b. The selling price is \_\_\_\_\_.

7. The cost was \$0.45 marked up 20%.

The selling price is \_\_\_\_\_.

Find the total cost. Round to the nearest whole cent.

8. 70 watts for 3 hours at 8.6¢ per hour

\_\_\_\_\_

$$\frac{w \times h}{1,000} = \text{kwh}$$

Solve.

9. a.  $-108 \div 12 =$  \_\_\_\_\_

b.  $-6 \times -9 =$  \_\_\_\_\_

c.  $-3 \overline{) - 210}$

10. a.  $-10 - (-15) =$  \_\_\_\_\_

b.  $-\frac{2}{3} \times \frac{1}{4} =$  \_\_\_\_\_

c.  $-6 - (-4) =$  \_\_\_\_\_

Rewrite using multiples of 10. Then use the distributive property to find the products.

11. a.  $5(28)$


b.  $4(73)$

c.  $8(205)$

d.  $3(1,012)$

Simplify.

12.  $\frac{2 \cdot 5 - 12 \div 4}{4 + 12 \cdot 2}$

-  13. Earl lives  $2\frac{1}{4}$  miles from the shop. As part of his exercise program, Earl walks to the shop when the weather is not too cold. Today he covered the  $2\frac{1}{4}$  miles in 1 hour and 15 minutes. What was his speed? Use fractions and the distance formula to solve. \_\_\_\_\_

## **Mastery Drill**

14. The *less than or equal to* symbol is \_\_\_\_\_.
15. The Pythagorean Theorem is true for every \_\_\_\_\_ triangle.
16. The formula for finding the volume of a pyramid or cone is \_\_\_\_\_.
17. A number factor in a term used with a variable is known as a numerical \_\_\_\_\_.
18. a. 1 quart = \_\_\_\_\_ fluid ounces                      b. 1 pint = \_\_\_\_\_ fluid ounces
19. a. The repeating decimal for  $\frac{2}{3}$  is \_\_\_\_\_.                      b. The decimal for  $\frac{3}{8}$  is \_\_\_\_\_.

☆ **Solve the logic problem.**

20. Inside an antique clock, Earl found an old coin dated 235 B.C. How did he know the old coin was worth nothing?

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**Simplify and solve.**

21. a.  $\sqrt{196} \cdot 2 = 3(x + 2)$     b.  $7x + 3^3 - 5x - 5^2 = \sqrt{81} + 5$

**Divide these numbers in scientific notation.**

22.  $(6.42 \times 10^8) \div (2 \times 10^6) =$  \_\_\_\_\_
23.  $(9.6 \times 10^{-8}) \div (3 \times 10^{-7}) =$  \_\_\_\_\_

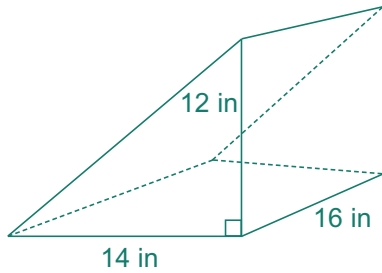
**Reduce to simplest form.**

24. a.  $\frac{18x^2}{6x} =$     b.  $\frac{x^5}{x^4} =$

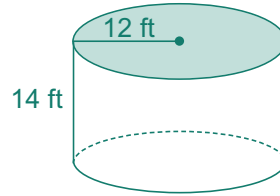
## Lesson 2



Use the formulas to find the volume of each solid. Use 3.14 for pi.



25. a. \_\_\_\_\_



b. \_\_\_\_\_



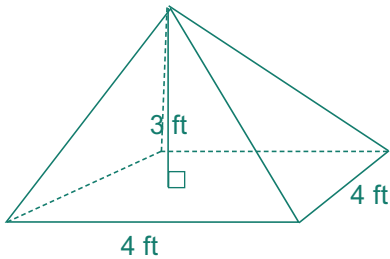
Convert. Round to the nearest whole.

26. 25 cm  $\approx$  \_\_\_\_\_ in

27. 55 lb  $\approx$  \_\_\_\_\_ kg

28. 50 yd  $\approx$  \_\_\_\_\_ m

Find the volume of each. Round  $b$  to the nearest hundredth.



29. a. \_\_\_\_\_



b. \_\_\_\_\_

Solve for the third angle of the triangle described.

30. If two angles measure  $32^\circ$  and  $84^\circ$ , the third angle measures \_\_\_\_\_ $^\circ$ .

$\triangle$  Use a compass and a straightedge to construct  $\triangle GHI$  from the parts given.

