Name_____ Date_____

Simplify the expression.

1. $18x - 6x + 2x$

2. $4b - 7 - 15b + 3$

3. $15(6 - g)$

4. $-24 + 2(y - 9)$

5. $9m + 4(12 - m)$

6. $16(a - 2) + 3(10 - a)$

7. You are selling lemonade for \$1.50, a bag of kettle corn for \$3, and a hot dog for \$2.50 at a fair. Write and simplify an expression for the amount of money you receive when p people buy one of each item.

Name_____ Date _____

Add or subtract.

   8. $-1 + (-3)$ **9.** $0 + (-12)$

   10. $-5 + (-3)$ **11.** $-4 + (-4)$

   12. $5 - (-2)$ **13.** $-5 - 2$

   14. $0 - (-6)$ **15.** $-9 - 3$

16. In a city, the record monthly high temperature for July is 88°F. The record monthly low temperature is 30°F. What is the range of temperatures for July?
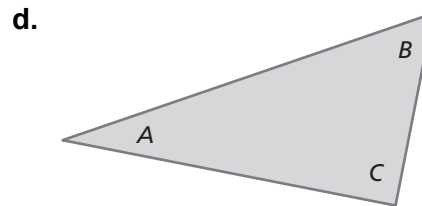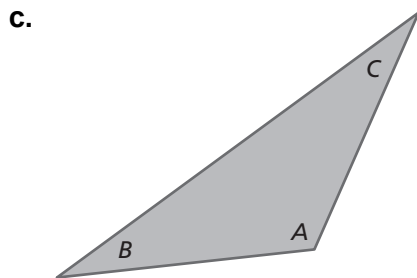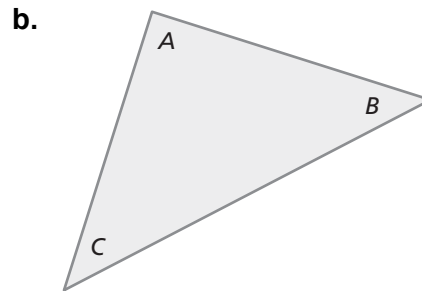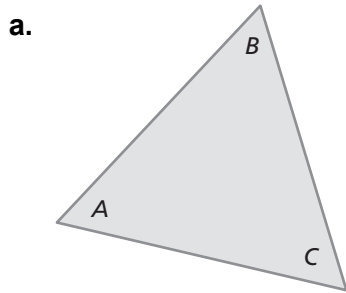
Name_____ Date _____

Solving Simple Equations
For use with Activity 1.1

Essential Question   How can you use inductive reasoning to discover rules in mathematics? How can you test a rule?

**1**   **ACTIVITY:** Sum of the Angles of a Triangle

Work with a partner. Use a protractor to measure the angles of each triangle. Complete the table to organize your results.

a.

b.

c.

d.

Triangle	Angle *A* (degrees)	Angle *B* (degrees)	Angle *C* (degrees)	*A* + *B* + *C*
a.				
b.				
c.				
d.				

1.1 **Solving Simple Equations** (continued)

2 **ACTIVITY:** Writing a Rule

Work with a partner. Use inductive reasoning to write and test a rule.

   a. **STRUCTURE** Use the completed table in Activity 1 to write a rule about the sum of the angle measures of a triangle.

   b. **TEST YOUR RULE** Draw four triangles that are different from those in Activity 1. Measure the angles of each triangle. Organize your results in a table. Find the sum of the angle measures of each triangle.

1.1 Solving Simple Equations (continued)

3 ACTIVITY: Applying Your Rule

**Work with a partner. Use the rule you wrote in Activity 2 to write an
equation for each triangle. Then solve the equation to find the value of *x*.
Use a protractor to check the reasonableness of your answer.**

a.

27°

x°

82°

b.

52°

43°

x°

c.

62.5°

77°

x°

d.

33.4°

x°

51.3°
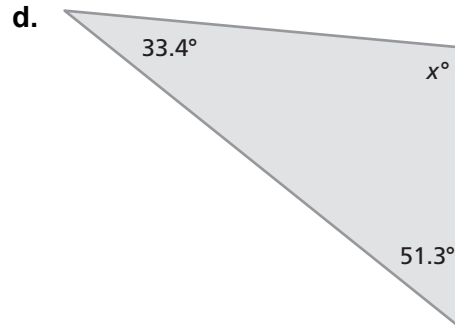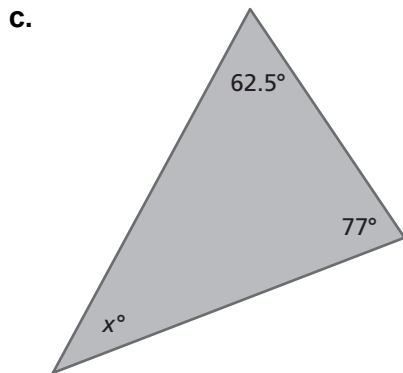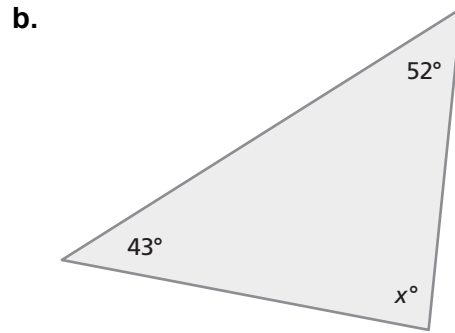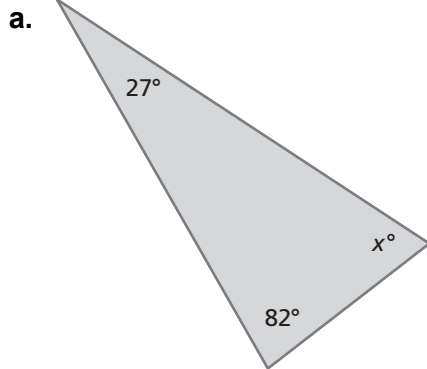
What Is Your Answer?

4. IN YOUR OWN WORDS How can you use inductive reasoning to discover
rules in mathematics? How can you test a rule? How can you use a rule to
solve problems in mathematics?

Name _____ Date _____

Practice
For use after Lesson 1.1

Solve the equation. Check your solution.

1. $x + 5 = 16$

2. $11 = w - 12$

3. $\dfrac{3}{4} + z = \dfrac{5}{6}$

4. $3y = 18$

5. $\dfrac{k}{7} = 10$

6. $\dfrac{4}{5}n = \dfrac{9}{10}$

7. $x - 12 \div 6 = 9$

8. $h + |-8| = 15$

9. $1.3(2) + p = 7.9$

10. A coupon subtracts $5.16 from the price p of a shirt. You pay $15.48 for the shirt after using the coupon. Write and solve an equation to find the original price of the shirt.

Name_____ Date _____

Essential Question How can you solve a multi-step equation? How can you check the reasonableness of your solution?

1 **ACTIVITY:** Solving for the Angles of a Triangle

Work with a partner. Write an equation for each triangle. Solve the equation to find the value of the variable. Then find the angle measures of each triangle. Use a protractor to check the reasonableness of your answer.
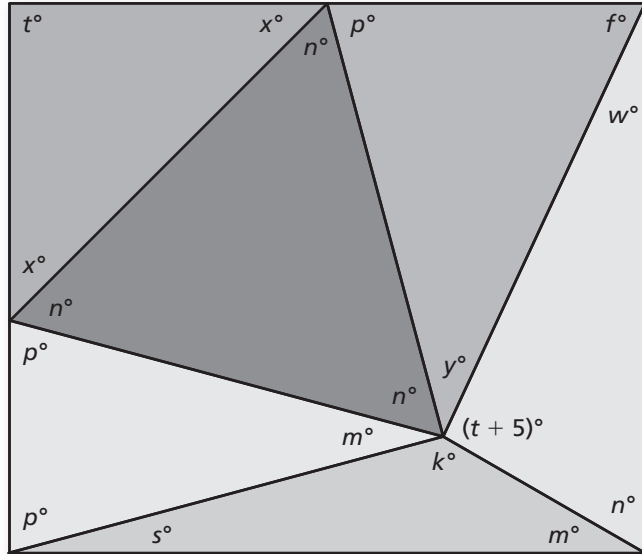
a.
$n°$
$42°$
$n°$

b.
$(x + 10)°$
$x°$
$(x + 5)°$

c.
$3q°$
$q°$
$q°$

d.
$m°$
$(m + 10)°$
$2m°$

e.
$(y - 30)°$
$y°$

f.
$2t°$
$(t + 10.5)°$
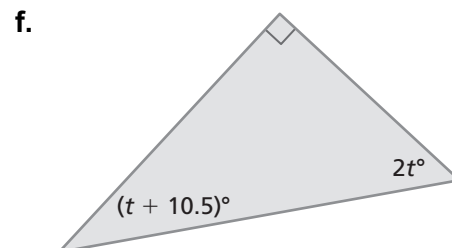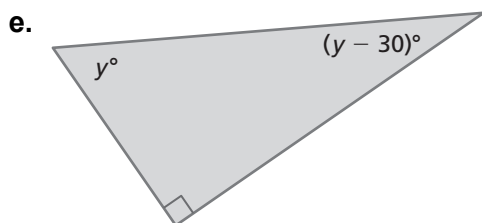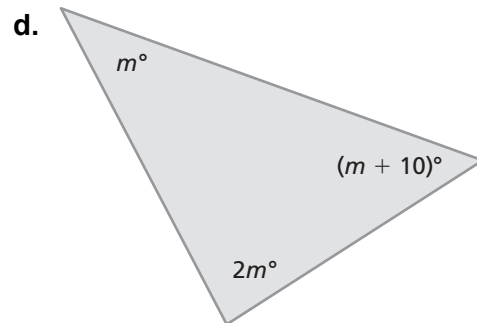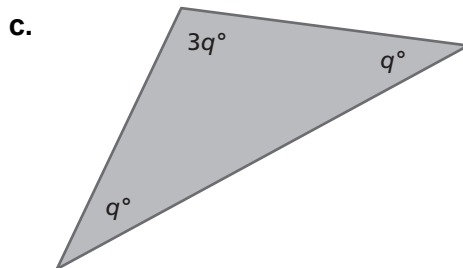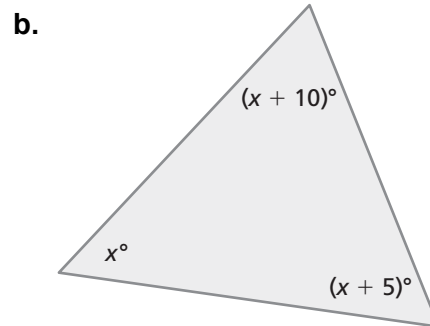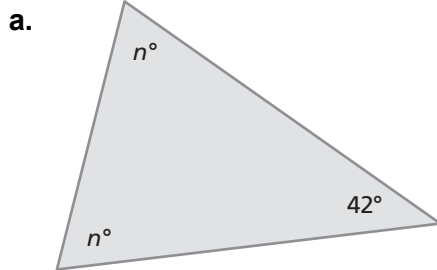
1.2 Solving Multi-Step Equations (continued)

2   ACTIVITY: Problem Solving Strategy

Work with a partner.

The six triangles form a rectangle.

Find the angle measures of each triangle. Use a protractor to check the reasonableness of your answers.

3   ACTIVITY: Puzzle

Work with a partner. A survey asked 200 people to name their favorite weekday. The results are shown in the circle graph.

   a. How many degrees are in each part of the circle graph?

   b. What percent of the people chose each day?

   c. How many people chose each day?

Favorite Weekday
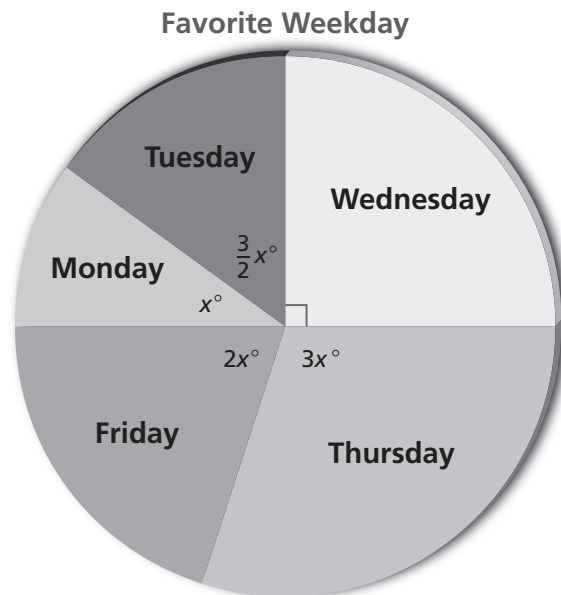
1.2 **Solving Multi-Step Equations** (continued)

    d. Organize your results in a table.

What Is Your Answer?

   4. IN YOUR OWN WORDS How can you solve a multi-step equation?
      How can you check the reasonableness of your solution?

Name _____ Date _____

1.2 Practice

For use after Lesson 1.2

Solve the equation. Check your solution.

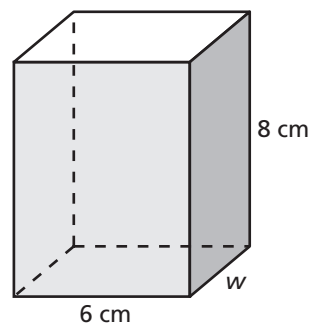**1.** $3x - 11 = 22$

2. $24 - 10b = 9$

3. $2.4z + 1.2z - 6.5 = 0.7$

4. $\dfrac{3}{4}w - \dfrac{1}{2}w - 4 = 12$

5. $2(a + 7) - 7 = 9$

6. $20 + 8(q - 11) = -12$

7. Find the width of the rectangular prism when the surface area is 208 square centimeters.

8 cm

6 cm

w

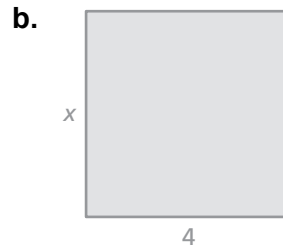# 1.3 Solving Equations with Variables on Both Sides
For use with Activity 1.3

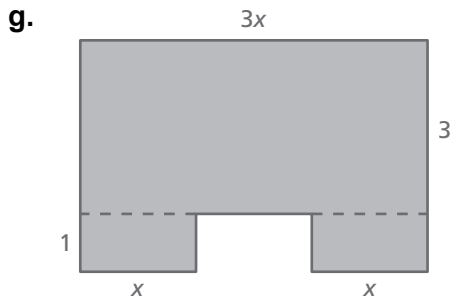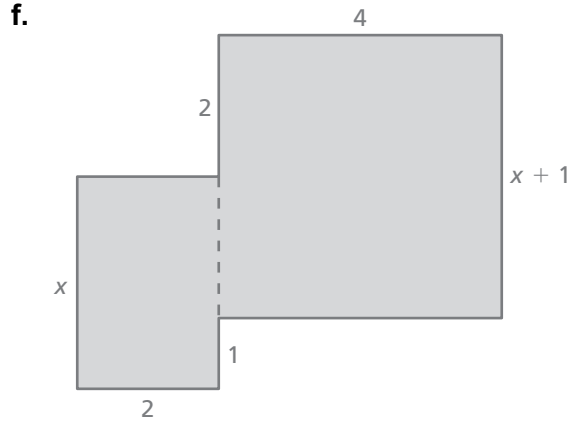## Essential Question How can you solve an equation that has variables on both sides?
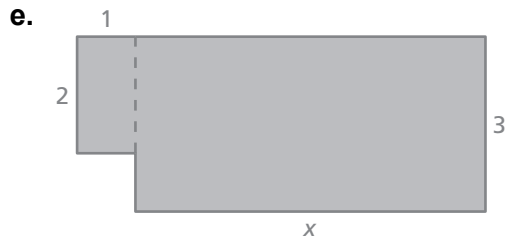
1 **ACTIVITY:** Perimeter and Area

Work with a partner.

- **Each figure has the unusual property that the value of its perimeter (in feet) is equal to the value of its area (in square feet). Write an equation for each figure.**

- **Solve each equation for *x*.**

- **Use the value of *x* to find the perimeter and the area of each figure.**

- **Describe how you can check your solution.**

a.

3

x

b.

x

4

c. x

18

d.

$\dfrac{5}{2}$

x

1.3   **Solving Equations with Variables on Both Sides** (continued)

e.

f.

g.

2 **ACTIVITY:** Surface Area and Volume

Work with a partner.

- **Each solid on the next page has the unusual property that the value of its surface area (in square inches) is equal to the value of its volume (in cubic inches). Write an equation for each solid.**

- **Solve each equation for _x_.**

- **Use the value of _x_ to find the surface area and the volume of each solid.**

- **Describe how you can check your solution.**

1.3 **Solving Equations with Variables on Both Sides (continued)**

a.

b.
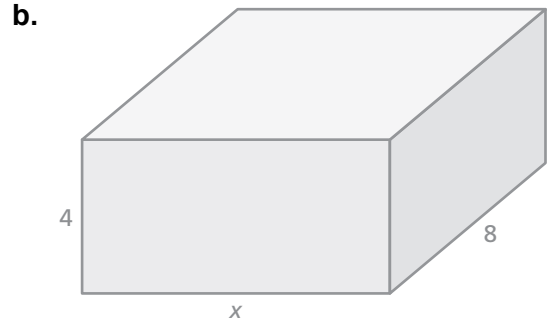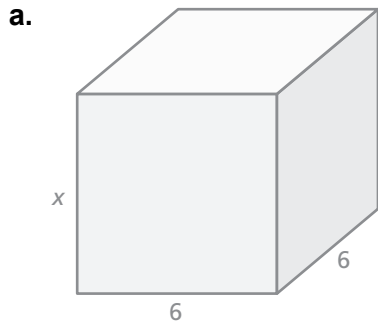
3 **ACTIVITY:** Puzzle

Work with a partner. The perimeter of the larger triangle is 150% of the perimeter of the smaller triangle. Find the dimensions of each triangle.
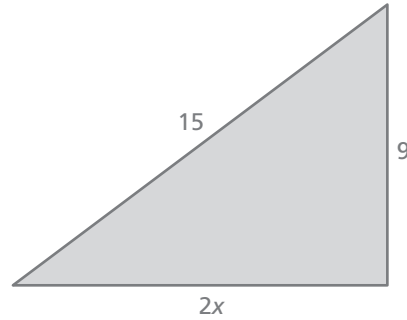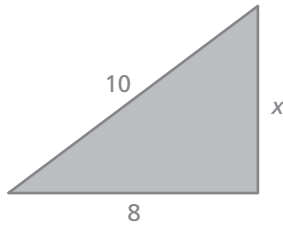
What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you solve an equation that has variables on both sides? How do you move a variable term from one side of the equation to the other?

5. Write an equation that has variables on both sides. Solve the equation.

Name _____ Date _____

Solve the equation. Check your solution.

1. $x + 16 = 9x$

2. $4y - 70 = 12y + 2$

3. $5(p + 6) = 8p$

4. $3(g - 7) = 2(10 + g)$

5. $1.8 + 7n = 9.5 - 4n$

6. $\dfrac{3}{7}w - 11 = -\dfrac{4}{7}w$

7. One movie club charges a $100 membership fee and $10 for each movie. Another club charges no membership fee but movies cost $15 each. Write and solve an equation to find the number of movies you need to buy for the cost of each movie club to be the same.

1.4 Rewriting Equations and Formulas
For use with Activity 1.4

Essential Question How can you use a formula for one measurement to write a formula for a different measurement?

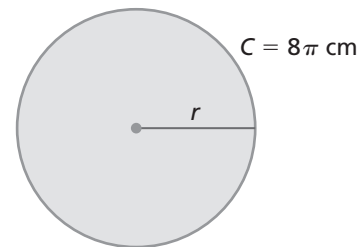**1** **ACTIVITY:** Using Perimeter and Area Formulas

Work with a partner.

a. • Write a formula for the perimeter P of a rectangle.

• Solve the formula for w.
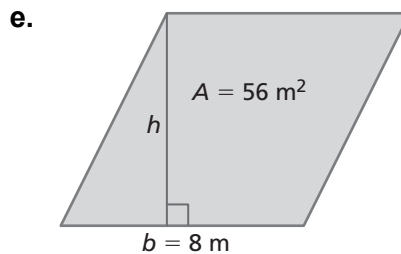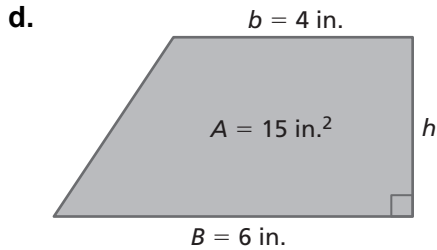
• Use the new formula to find the width of the rectangle.

w $P = 19$ in.

$\ell = 5.5$ in.

$A = 10$ in.^{2}

h

$b = \dfrac{5}{2}$ in.
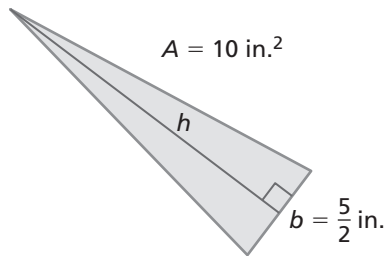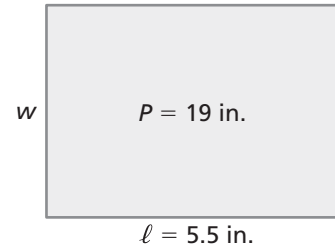
b. • Write a formula for the area A of a triangle.

• Solve the formula for h.

• Use the new formula to find the height of the triangle.

c. • Write a formula for the circumference C of a circle.

• Solve the formula for r.

• Use the new formula to find the radius of the circle.

$C = 8\pi$ cm

r

1.4 Rewriting Equations and Formulas (continued)

- **Write a formula for the area *A*.**
- **Solve the formula for *h*.**
- **Use the new formula to find the height.**

d.

$b = 4$ in.

$A = 15$ in.^{2}

h

$B = 6$ in.

e.

$A = 56$ m^2

h

$b = 8$ m

**2) ACTIVITY: Using Volume and Surface Area Formulas**

Work with a partner.

a.
- Write a formula for the volume *V* of a prism.
- Solve the formula for *h*.
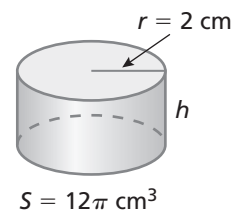- Use the new formula to find the height of the prism.

$V = 60$ in.^{3}

h

$B = 12$ in.^{2}
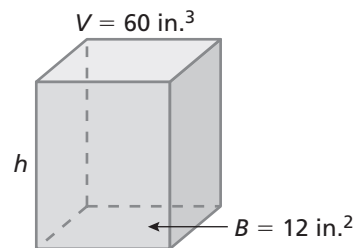
**1.4** **Rewriting Equations and Formulas (continued)**

b. • Write a formula for the volume V of a pyramid.

• Solve the formula for B.

• Use the new formula to find the area of the base of the pyramid.

$V = 48$ ft^3

$h = 9$ ft

B
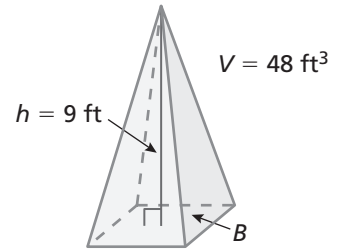
c. • Write a formula for the lateral surface area S of a cylinder.

• Solve the formula for h.

• Use the new formula to find the height of the cylinder.

$r = 2$ cm

h

$S = 12\pi$ cm^3

d. • Write a formula for the surface area S of a rectangular prism.

• Solve the formula for ℓ.

• Use the new formula to find the length of the rectangular prism.

$S = 108$ m^2

$h = 3$ m

$w = 4$ m

ℓ
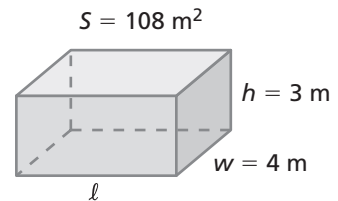
What Is Your Answer?

3. IN YOUR OWN WORDS How can you use a formula for one measurement to write a formula for a different measurement? Give an example that is different from the examples on these three pages.

Name _____ Date _____

Solve the equation for *y*.

1. $2x + y = -9$ **2.** $4x - 10y = 12$ **3.** $13 = \dfrac{1}{6}y + 2x$

Solve the formula for the bold variable.

4. $V = \ell wh$ **5.** $f = \dfrac{1}{2}(\boldsymbol{r} + 6.5)$ **6.** $S = 2\pi r^2 + 2\pi r\boldsymbol{h}$

7. The formula for the area of a triangle is $A = \dfrac{1}{2}bh$.

    a. Solve the formula for *h*.

    b. Use the new formula to find the value of *h*.

$A = 54$ in.^{2}

h

12 in.