Math Success Reproducible Worksheets
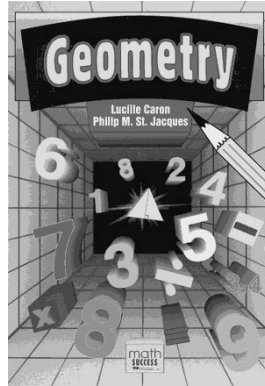
Reproducible Worksheets for:

Geometry

These worksheets practice math concepts explained in **Geometry** (ISBN 0-7660-1433–9), written by Lucille Caron and Philip M. St. Jacques.

Math Success reproducible worksheets are designed to help teachers, parents, and tutors use the books in the Math Success series in the classroom and home. Teachers, librarians, tutors, and parents are granted permission and encouraged to make photocopies of these worksheets.

Visit www.enslow.com and search for the **Math Success** series and download worksheets for the following titles:

Addition and Subtraction	**Multiplication and Division**
0-7660-1432-0	0-7660-1431–2
Fractions and Decimals	**Percents and Ratios**
0–7660–1430–4	0–7660–1435–5
Geometry	**Pre–Algebra and Algebra**
0-7660-1433–9	0-7660-1434–7

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
>E-mail: customerservice@enslow.com
>Web Page: http://www.enslow.com

Name _____   Date _____

Points, Lines, Planes, Line Segments, and Rays

Fill in the blanks below with these terms.

    point   intersecting lines   line   line segment

   plane   perpendicular lines   ray   parallel lines   skewed lines

a. Two lines that meet are called _____.

b. Two lines that intersect and form a right angle are called _____.

c. A _____ is part of a line with one endpoint but goes on
    forever in the other direction.

d. The symbol for a _____ is a dot.

e. A _____ is any flat surface that continues in all directions.

f. In geometry, a _____ extends endlessly in both directions.

g. A _____ is part of a line with two endpoints.

h. Lines that are not in the same plane and do not intersect are called

    _____.

i. _____ are two lines in the same plane yet
    never intersect.

Name _____   Date _____

Angles

Fill in the blanks with these terms.

  straight angle   right angle   acute angle   obtuse angle   vertex

a. A _____ measures 90°.

b. When you write an angle with three letters (∠ABC), the _____ is
    always the middle letter.

c. An _____ is greater than 90°.
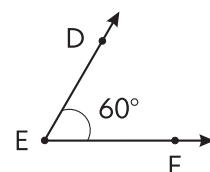
d. A _____ measures 180°.

e. An _____ is less than 90°.
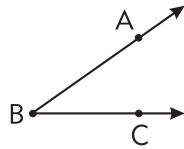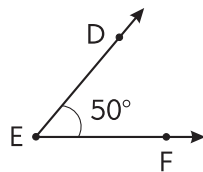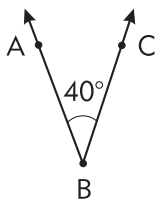

f. In this figure, the vertex is _____ .

g. In the figure, the two rays are _____and _____ .

h. In the figure, is the angle acute or obtuse? _____

Two angles are complementary if their measures have a sum of 90°.
Two angles are supplementary if their measures have a sum of 180°.

Are the pairs of angles below complementary or supplementary?

i. _____   j. _____

Name _____   Date _____
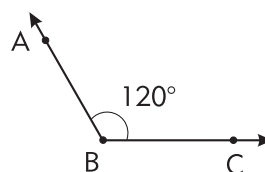
Polygons

Write TRUE or FALSE for the following statements.

a. A polygon must be a closed figure.   _____

b. A polygon must be bounded by line segments.   _____

c. A circle is a polygon.   _____

d. A triangle has 3 sides and 3 angles.   _____

e. A polygon with 5 sides is called a hexagon.   _____

f. The size of the angles in a triangle must all be the same. _____

g.   is a quadrilateral.   _____

h.   is a polygon.   _____

i. Octagons have 8 sides.   _____

j. Quadrilaterals have 4 angles.   _____

Fill in the table with the correct numbers.

Polygons	Number of Sides	Number of Angles
Triangles	k.	
Quadrilaterals	l.	
Pentagons	m.	
Hexagons	n.	
Octagons	o.	
Nanogon	p.	
Decagon	q.	

Name _____   Date _____

Triangles

Use these terms to identify the triangles.

| right triangle | equilateral triangle | isosceles triangle |
| scalene triangle | obtuse triangle | acute triangle |

a.

_____

b.

_____

c.

50°   20°
110°

_____

d.

45°
45°
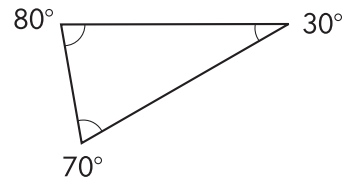

_____

e.

_____

f.

80°   30°
70°

_____
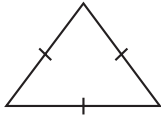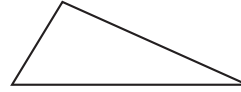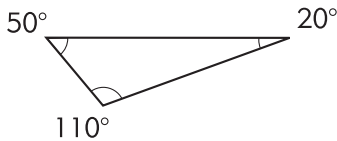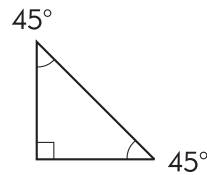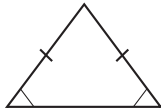
Fill in the blanks.

g. An angle greater than 90 degrees is an _____ angle.

h. All the angles of a triangle add up to _____ degrees.

i. A right angle is one that is equal to _____ degrees.

j. Two figures are _____ if they are the same size and the same shape.

k. An angle less than 90 degrees is an _____ angle.

Name _____   Date _____

Circles

Use these terms to identify the circles.
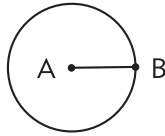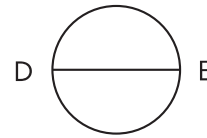
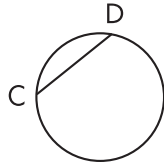   radius   semicircle   chord   diameter   arc   central angle
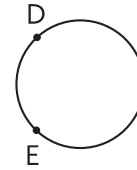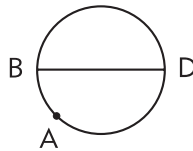
a.

$\overline{BA}$ = _____

b.

$\overline{DE}$ = _____

c.

$\overline{CD}$ = _____

d.

DE = _____

e.

DAB = _____

f.
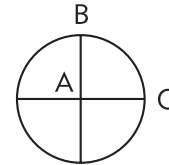
∠BAC = _____

Fill in the blanks.

g. The _____ of a circle is another name for the perimeter of a circle.

h. An _____ is part of a circle named by either two or three points on
    the circumference of the circle.

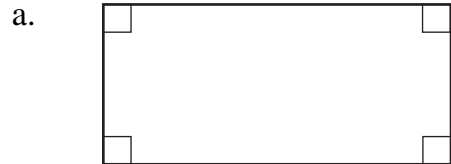i. A _____ is a line segment that connects any two points on the
    circle.

j. A chord that passes through the center of a circle is called a
    _____.

k. A _____ angle has the center of a circle as its vertex.
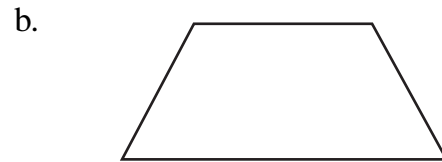
Name _____   Date _____

Quadrilaterals

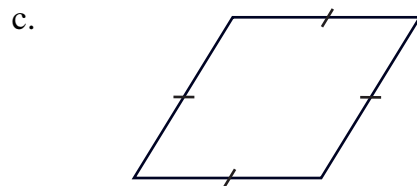Use these terms to identify the quadrilaterals.

square   rhombus   trapezoid   rectangle

a.
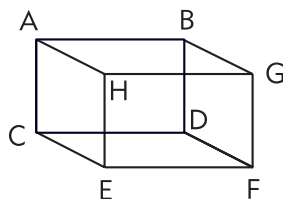
_____

b.

_____

c.

_____

d.

_____
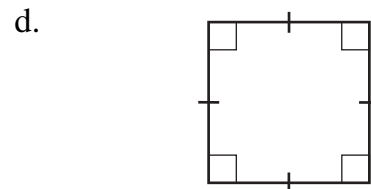
Fill in the blanks.

e. _____ lines are lines that never meet.

f. A _____ is a quadrilateral with opposite sides that are parallel.

g. Every rectangle is a _____.

h. Every rhombus is a _____.

i. Every _____ is a rectangle, rhombus, and parallelogram.

j. A _____ is a polygon with four sides.

Name _____   Date _____
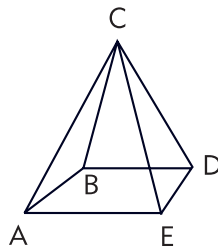
Prisms and Pyramids

Fill in the blanks.

a. Two-dimensional objects have _____ and _____.

b. Three-dimensional objects have _____, _____, and

   _____.

c. The 6 faces in the above quadrilateral prism are _____, _____,
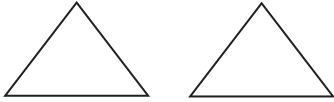
   _____, _____, _____, and _____.

d. The pyramid above is a quadrilateral pyramid because the _____ of the
   pyramid is a quadrilateral.

e. The point at which the faces of a pyramid meet is called the _____.

f. The 5 faces of this pyramid are _____, _____,

   _____, _____, and _____.

Name _____   Date _____

Congruent Figures
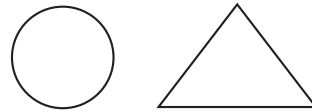
Label the following figures as congruent or not congruent.

a.

b.
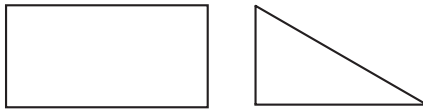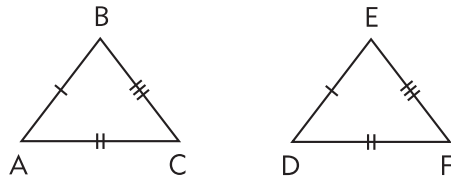
_____

_____

c.

_____

Use triangles ABC and DEF for the following problems.

B   E

A   C   D   F

d. $\overline{AB} \cong$ _____   e. $\overline{AC} \cong$ _____   f. $\overline{BC} \cong$ _____

g. Triangle ABC is congruent to triangle DEF because the corresponding sides are

_____.

h. The triangles have the same _____.

Use triangles ABC and DEF for the following problems.

B   E

A   C   D   F
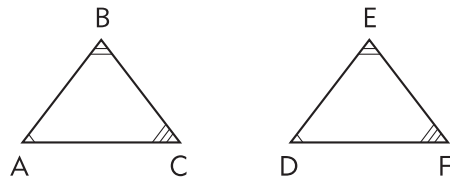
i. ∠A = ∠ _____   j. ∠B = ∠ _____   k. ∠C = ∠ _____

l. Triangle ABC is congruent to triangle DEF because the corresponding

_____ and the corresponding _____ are congruent.

Name _____   Date _____

Similar Figures

Similar figures have the same shape but not necessarily the same size.

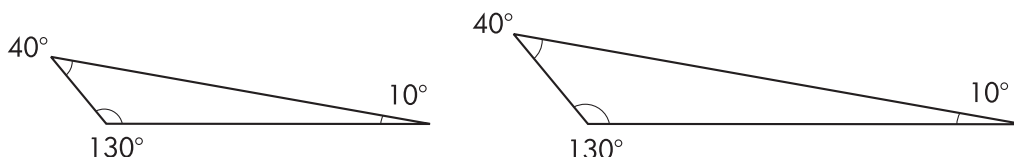Corresponding angles of similar triangles are congruent.

Give the corresponding angles for the following using the figures below.

a. ∠A ≅ _____   b. ∠B ≅ _____   c. ∠C ≅ _____

Triangles are similar if corresponding angles are equal. As a result the ratios of the lengths of corresponding sides are also equal.
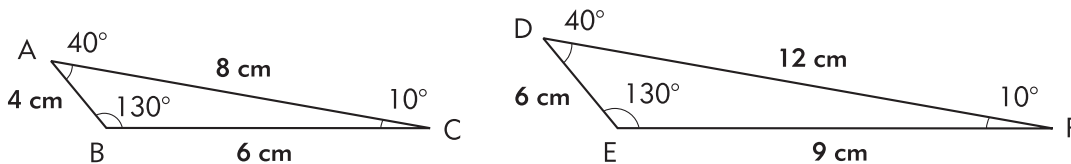
$$\frac{\text{Length AB}}{\text{Length DE}} = \frac{4}{6} = \frac{2}{3}$$

d. $\dfrac{\text{Length } \overline{BC}}{\text{Length } \overline{EF}} =$ _____

e. $\dfrac{\text{Length } \overline{AC}}{\text{Length } \overline{DF}} =$ _____

Name _____   Date _____

Similar Figures, continued

Triangle RST and triangle XYZ are similar.
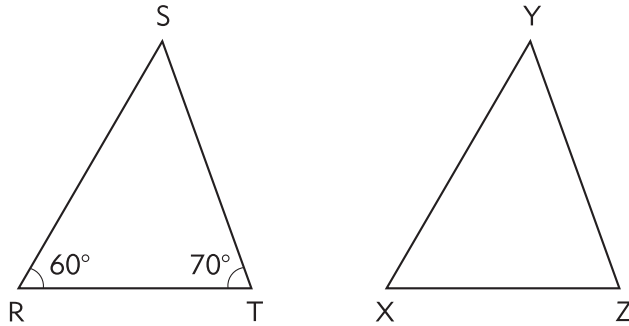

Find the measure of each angle.

a. ∠S _____   b. ∠X _____

c. ∠Z _____   d. ∠Y _____

Triangle PQR and triangle EFG are similar.
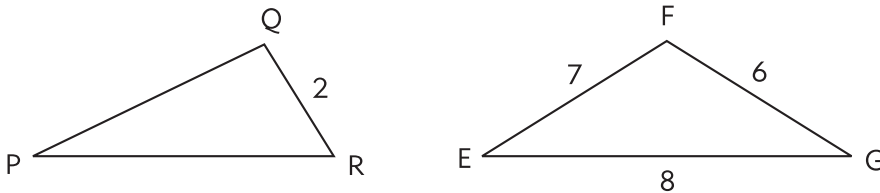
Write the corresponding sides.

e. $\overline{PQ}$ ↔ _____   f. $\overline{QR}$ ↔ _____   g. $\overline{PR}$ ↔ _____

Find the length of each side.

h. side $\overline{PQ}$ = _____

i. side $\overline{PR}$ = _____

Symmetry

Many designers use symmetry to create their designs and to create two matching parts. Some buildings are designed to be symmetrical.

You can create a line of symmetry in the drawing of the house below by placing a line down the center of the house. The house has two matching halves.
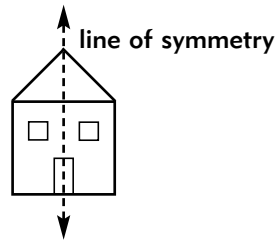
Draw the lines of symmetry on the following figures.

a.

b.

c.

d.

e.
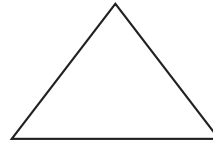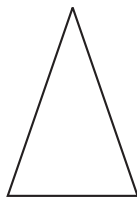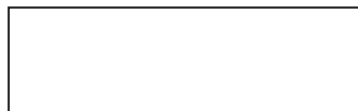
Cones and Cylinders

Label the following statements as either true or false. Correct the false statements.

a. Congruent means having the same size and shape.   _____

b. A cone is a two-dimensional figure that has a
    closed curve for a base.   _____

c. The base of a cone is a nonpolygon.   _____

d. The point of a cone is called the vertex.   _____

e. A can is an example of a cone.   _____

f. A cylinder has no vertex.   _____

g. A cylinder has two parallel bases.   _____

Label the parts of a cone.

h. _____

i. _____

j. _____
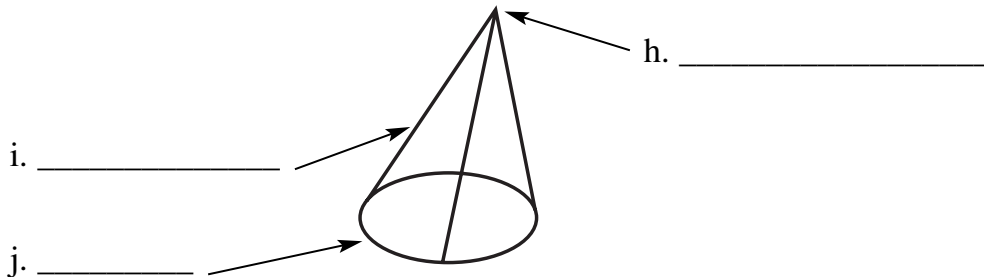
Label the parts of a cylinder.

k. _____

l. _____

m. _____
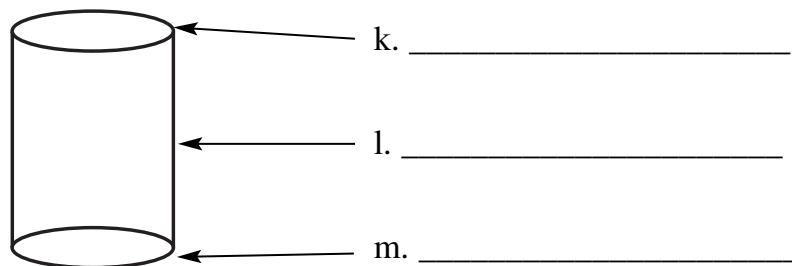
Slides

A slide is made by moving a figure or object along a line.

a. Draw a slide image of this figure.
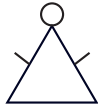
b. Draw a slide image of this letter.

Reflections

A flip image is called a reflection.

c. Draw a reflection of this figure.
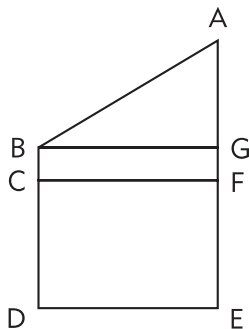
Rotations

Turning a figure around a point is called a rotation.

Rotate this figure 90 degrees to the right by the number
of turns listed below.

a. 1 turn to the right.

b. 2 turns to the right.

c. 3 turns to the right.

d. 4 turns to the right.
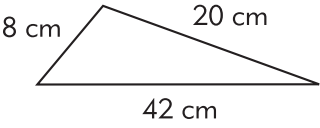
Rotate this figure 90 degrees to the left by the number
of turns listed below.

a. 1 turn to the left.

b. 2 turns to the left.

c. 3 turns to the left.

d. 4 turns to the left.

Name _____   Date _____

Perimeters

The perimeter of a figure is the distance around it. To find the perimeter of a polygon, add the lengths of all the sides.

Example: 8 cm ⟍ 20 cm   **perimeter, or P = 8 cm + 20 cm + 42 cm = 70 cm**
42 cm

Formula for a square $P = 4 \times s$ (s = length of one side)
Formula for a rectangle $P = (2 \times \text{length}) + (2 \times \text{width})$, or $2(l + w)$

Find the perimeter of each polygon.

a.   12 cm
                              6 cm

P = _____

b.   5 m

P =_____

c.
10 cm   10 cm
       12 cm

P = _____

d.   3 cm
5 cm   4 cm
   8 cm   9 cm

P =_____

e.   9 yd
                              6 yd

P = _____

f.   8 ft
6 ft   6 ft
      12 ft

P =_____

Name _____   Date _____
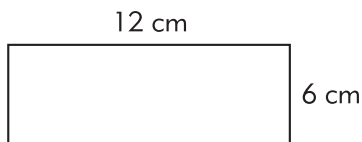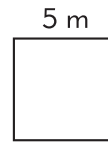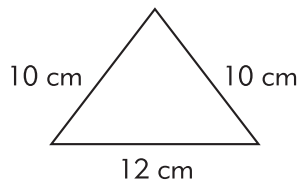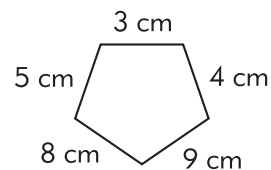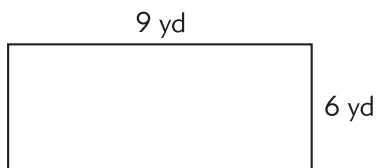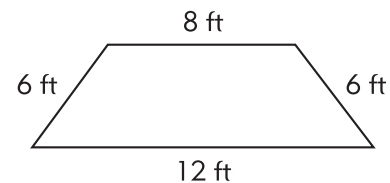
Areas of Rectangles and Squares

Area of rectangle = length × width, or lw

Example: **Your living room is 12 feet long and 10 feet wide. What is the area of this room?**

A = l × w
A = 10 feet × 12 feet
A = 120 square feet   <u>NOTE: Area is always expressed in square units.</u>

Area of a square = side × side, or s^2

Example: **Find the area of a room that is 8 feet square.**

A = s^2
A = 8 feet × 8 feet
A = 64 square feet

Find the area of the following.

a. a rectangle 64 cm by 10 cm   _____

b. a square whose side is 15 feet   _____

c. a square whose side is 4.7 meters   _____

d. a rectangle 3.4 feet by 8 feet   _____

e. a rectangle 35 meters by 14 meters   _____

f. a square whose side is 7 inches   _____

Areas of a Triangles

Area of triangle $= \dfrac{1}{2} \times$ base $\times$ height, or $\dfrac{1}{2} \times$ b $\times$ h

Example:
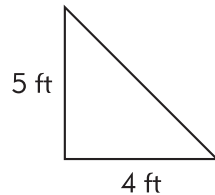
$A = \dfrac{1}{2} \times$ **base** $\times$ **height**

$A = \dfrac{1}{2} \times$ **4 feet** $\times$ **5 feet**

$A =$ **10 square feet**

5 ft

4 ft

Find the area of these triangles.

a. base 4 m, height 3.5 m   _____

b. base 80 cm, height 60 cm   _____

c. base 2.4 m, height 2.4 m   _____

d. base 16 ft, height 4 ft   _____

e. base 7 in, height 6 in   _____

f. base 12 ft, height 8 ft   _____

g. base 23 ft, height 16 ft   _____

h. base 10 m, height 21 m   _____

Name _____   Date _____

Areas of a Parallelograms

Area of parallelogram = base × height, or b × h

Example:
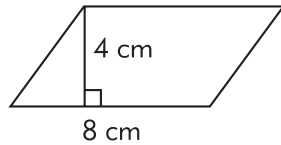
$A = b \times h$

$A = 8\ cm \times 4\ cm$

$A = 32\ sq\ cm$

Find the area of these parallelograms.

a.

6 ft

12 ft

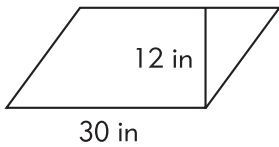_____

b.

1.5 cm

4 cm

_____

c.

12 in

30 in

_____

d.

6 m

14 m

_____

e.

3.7 cm

7.2 cm
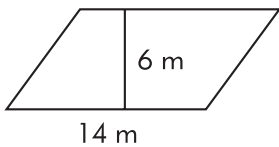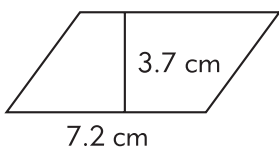
_____
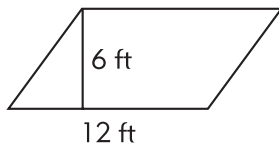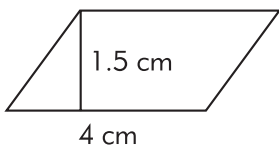
Name _____   Date _____

Circumference and Area of Circles

Circumference of a circle is another name for the perimeter of a circle.

　　　Circumference of a circle $= \pi \times d$　　　　$(\pi = 3.14,$ or $\dfrac{22}{7})$

Example:　　**Find the circumference of a plate whose diameter is 8 inches.**
　　　　　　Circumference $= \pi \times d$
　　　　　　　　　　$= 3.14 \times 8$ inches
　　　　　　　　　　$= 25.12$ inches　　　　8 in
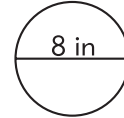
Find the circumference of circles with the following diameters.

a. d = 12 feet　　　　　　_____

b. d = 18 inches　　　　　_____

c. d = 7 centimeters　　　_____

d. d = 35 feet　　　　　　_____

e. d = 11 centimeters　　_____

f. d = 50 meters　　　　　_____

Area of a circle $= \pi \times$ radius $\times$ radius, or πr^2

Example:　　**Find the area of a dinner plate whose diameter is 8 inches. The radius
　　　　　　is half the diameter.**
　　　　　　　　　　　　4 in　　　**A $= 3.14 \times 4$ x 4**
　　　　　　　　　　　　　　　　A $= 50.24$ sq in
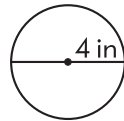
Find the area of these circles with the following radii.

a. r = 6 centimeters　　　_____

b. r = 6 feet　　　　　　　_____

c. r = 7 centimeters　　　_____

d. r = 35 feet　　　　　　_____

Areas of Composites

A composite is a figure made up of distinct parts, such as a rectangle and half circles.

```
      ┌─────────────────────────┐
     ╱  │                     │  ╲
    │ A │ 4 ft       B        │ C │
     ╲  │                     │  ╱
      └─────────────────────────┘
              8 ft
```
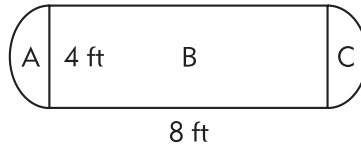
Example: **Find the area of this composite.**

Step 1: **First find the areas of A, B, and C.**

　　a. **Area A = Area C = $\dfrac{1}{2}\,\pi^2 = \dfrac{1}{2} \times 3.14 \times 2$ ft $\times$ 2 ft = 6.28 sq ft**

　　b. **Area B = l $\times$ w = 8 ft $\times$ 4 ft = 32 sq ft**

Step 2: **Find the sum of areas A, B, and C.**

6.28 sq ft + 6.28 sq ft + 32 sq ft = 44.56 sq ft

Find the areas of these composite figures.

a. _____

b. _____

Name _____   Date _____
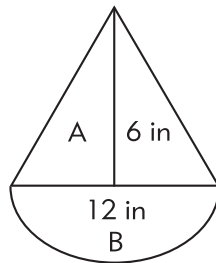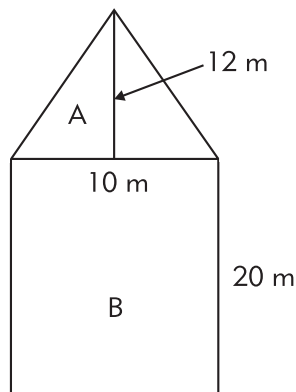
Volume of Prisms

The space that a three-dimensional figure can hold is called its volume.

Volume of a prism = area of base × height

Example:

Area of base = **6 cm × 5 cm = 30 sq cm**
Volume = **30 sq cm × 4 cm**
Volume = **120 cubic cm**

6 cm   4 cm
5 cm

Find the volume of these prisms.

15 ft
6 ft
5 ft

a. _____

4 m   7 m
20 m

b. _____

30 ft
15 ft
25 ft

c. _____

Name _____   Date _____
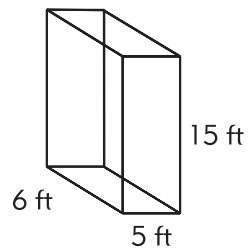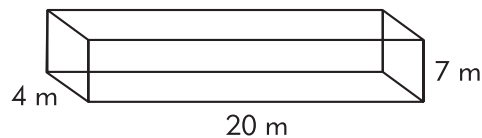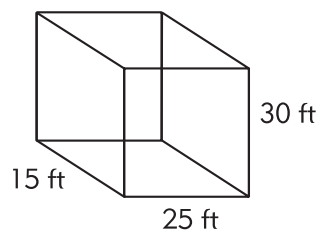
Volume of Cones and Cylinders

Volume of a cone $= \dfrac{1}{3}\pi r^2 h$

Example:

h = 7 cm

r = 3 cm
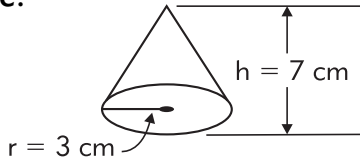
Volume $= \dfrac{1}{3}\pi r^2 h$

Volume $= \dfrac{1}{3} \times \dfrac{22}{7} \times \dfrac{9}{1}$ cm $\times \dfrac{7}{1}$ cm

$= 66$ cubic cm

Find the volume of the cones with these dimensions.

a. radius 4 cm, height 15 cm   _____

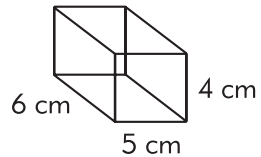b. radius 5 cm, height 12 cm   _____

c. radius 3 cm, height 28 cm   _____

Volume of a cylinder $= \pi r^2 h$

Example: r = 6 cm →

h = 9 cm
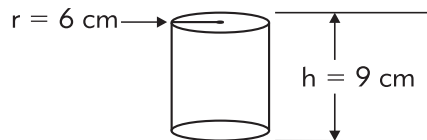
Volume $= \pi r^2 h$
Volume $= 3.14 \times 6$ cm $\times 6$ cm $\times 9$ cm
Volume $= 1{,}017.36$ cubic cm

Find the volume of the cylinders with these dimensions.

a. radius 7 in, height 12 in   _____

b. radius 2 cm, height 5 cm   _____

c. radius 8 cm, height 10 cm   _____

Geometry Answers

Points, Lines, Planes, Line Segments, and Rays, page 2
a. **intersecting lines**; b. **perpendicular lines**; c. **ray**; d. **point**; e. **plane**; f. **line**; g. **line segment**; h. **skewed line**s; i. **parallel lines**

Angles, page 3
a. **right angle**; b. **vertex**; c. **obtuse angle**; d. **straight angle**; e. **acute angle**; f. **B**; g. **BA, BC**; h. **acute**; i. **complementary**; j. **supplementary**

Polygons, page 4
a. **true**; b. **true**; c. **false**; d. **true**; e. **false**; f. **false**; g. **true**; h. **false**; i. **true**; j. **true**
k. **3, 3**; l. **4, 4**; m. **5, 5**; n. **6, 6**; o. **8, 8**; p. **9, 9**; q. **10, 10**

Triangles, page 5
a. **equilateral triangle**; b. **scalene triangle**; c. **obtuse triangle**; d. **right triangle**; e. **isosceles triangle**; f. **acute triangle**; g. **obtuse**; h. **180**; i. **90**; j. **congruent**; k. **acute**

Circles, page 6
a. **radius**; b. **diameter**; c. **chord**; d. **arc**; e. **semicircle**; f. **central angle**; g. **circumference**; h. **arc**; i. **chord**; j. **diameter**; k. **central**

Quadrilaterals, page 7
a. **rectangle**; b. **trapezoid**; c. **rhombus**; d. **square**; e. **Parallel**; f. **parallelogram**; g. **parallelogram**; h. **parallelogram**; i. **square**; j. **quadrilateral**

Prisms and Pyramids, page 8
a. **length, width**; b. **length, width, height**; c. **CDFE, ABGH, BGFD, ABDC, HGFE, ACEH**; d. **base**; e. **vertex**; f. **ABDE, CAB, CBD, CED, CAE**

Congruent Figures, page 9
a. **congruent**; b. **not congruent**; c. **not congruent**; d. **DE**; e. **DF**; f. **EF**; g. **congruent**; h. **shape**; i. ∠**D**; j. ∠**E**; k. ∠**F**; l. **diameter**; m. **angles/sides**; **sides/angles**

Similar Figures, page 10
a. ∠**D**; b. ∠**E**; c. ∠**F**; d. $\dfrac{4}{6} = \dfrac{2}{3}$; e. $\dfrac{8}{12} = \dfrac{2}{3}$

Similar Figures, con't, page 11
a. **50°**; b. **60°**; c. **70°**; d. **50°**; e. **EF**; f. **FG**; g. **EG**; h. $2\dfrac{1}{3}$; i. $2\dfrac{2}{3}$

Symmetry, page 12
a. ; b. ; c. ; d. ; e.
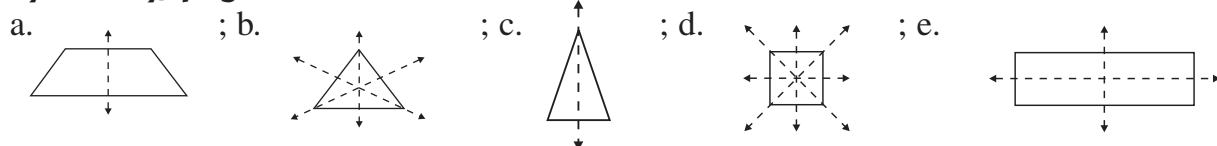
Cones and Cylinders, page 13
a. **true**; b. **false, three-dimensional**; c. **true**; d. **true**; e. **false, cylinder**; f. **true**; g. **true**;
h. **vertex**; i. **lateral face**; j. **base**; k. **base**; l. **lateral face**; m. **base**

Slides and Reflections, page 14

a. ;

b. ;

c.

Rotations, page 15

a. ; b. ; c. ; d. ; e. ; f. ;

g. ; h.
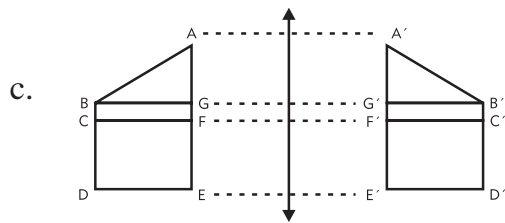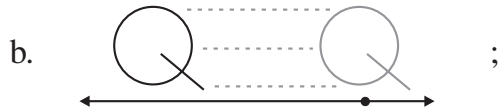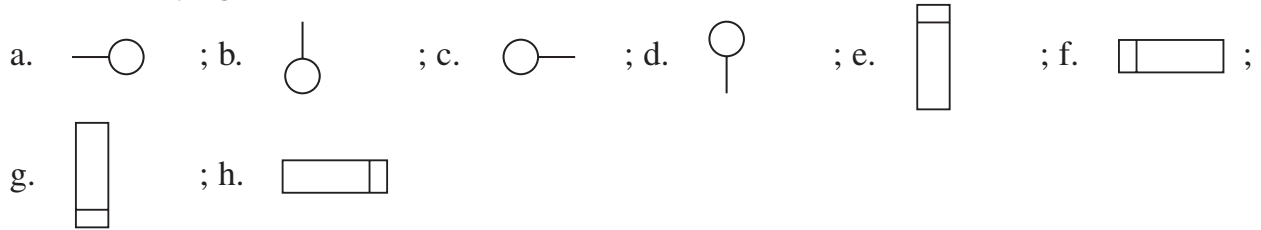
Perimeters, page 16
a. **36 cm**; b. **20 m**; c. **32 cm**; d. **29 cm**; e. **30 yd**; f. **32 ft**

Areas of Rectangles and Squares, page 17
a. **640 sq cm**; b. **225 sq ft**; c. **22.09 sq m**; d. **27.2 sq ft**; e. **490 sq m**; f. **49 sq in**

Areas of Triangles, page 18
a. **7 sq m**; b. **2,400 sq cm**; c. **288 sq cm**; d. **32 sq ft**; e. **21 sq in**; f. **48 sq ft**;
g. **184 sq ft**; h. **105 sq m**

Areas of Parallelograms, page 19
a. **72 sq ft**; b. **6 sq cm**; c. **360 sq in**; d. **84 sq m**; e. **26.64 sq cm**

Circumference and Area of Circles, page 20
a. **37.68 ft**; b. **56.52 in**; c. **21.98 cm**; d. **109.9 ft**; e. **34.54 cm**; f. **157 m**;
g. **113.04 sq cm**; h. **28.26 sq ft**; i. **314 sq m**; j. **153.86 sq ft**

Areas of Composites, page 21
a. **92.52 sq in**; b. **260 sq m**

Volume of Prisms, page 22
a. **450 sq ft**; b. **560 sq m**; c. **11,250 sq ft**

Volume of Cones and Cylinders, page 23
a. **251.2 cubic cm**; b. **314 cubic cm**; c. **264 cubic cm**; d. **1,846.32 cubic in**;
e. **62.8 cubic cm**; f. **210.96 cubic cm**