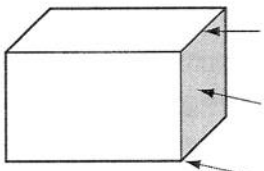
Name _____

Relating Solids and Plane Figures

R 8-1

Solid figures have three dimensions: length, width, and height. Many solids have edges, faces, and vertices.



Rectangular prism

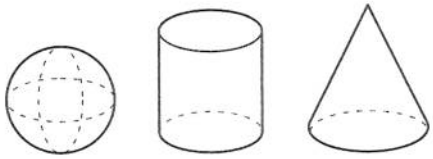
Edge: the line segment where 2 faces meet

Face: the flat surface of solid figures

Vertex: the corner where 3 or more edges meet

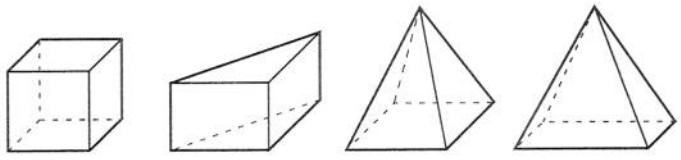
Spheres, cylinders, and cones have curved surfaces. Other solids have all flat surfaces.

Curved Surfaces



Sphere Cylinder Cone

Flat Surfaces



Cube Triangular prism Square pyramid Rectangular pyramid

Complete the table.

	Solid Figure	Number of Faces	Number of Edges	Number of Vertices	Shape(s) of Faces
1.	Rectangular prism				
2.	Cube				
3.	Triangular prism				
4.	Square pyramid				

5. **Reasoning** Compare rectangular pyramids and rectangular prisms. How are they alike?

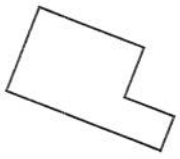
_____

Name_____

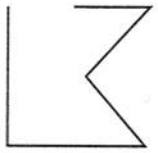
Polygons

R 8-2

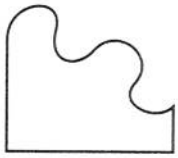
Polygons are closed plane figures that are made up of line segments. All of the line segments connect. All of the sides of a polygon are straight, not curved.



Polygon
Closed figure made of straight lines

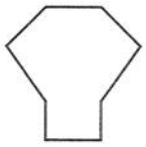


Not a polygon
Not a closed figure



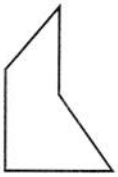
Not a polygon
Not all of the lines are straight.

Here are some common polygons. Note that the sides of polygons do not all have to be the same length.

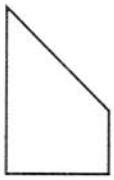


Octagon
8 sides

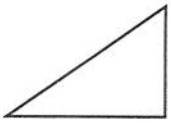
Hexagon
6 sides



Pentagon
5 sides



Quadrilateral
4 sides



Triangle
3 sides

Draw an example of each type of polygon. How many sides and vertices does each one have?

1. Hexagon

_____

2. 7-sided polygon

_____

3. Pentagon

_____

4. 9-sided polygon

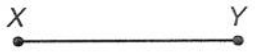
_____

Name _____

Lines, Line Segments, Rays, and Angles

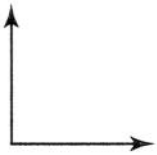
R 8-3

Here are some important geometric terms.

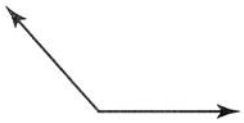


Line segment
A part of a line. It has two endpoints. This is line segment *XY*.

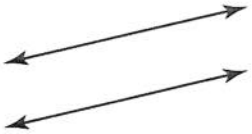
Ray
A part of a line. It has one endpoint and goes on and on in one direction. This is ray *AB*.



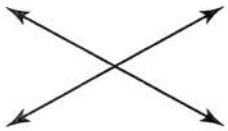
Right angle
A square corner.



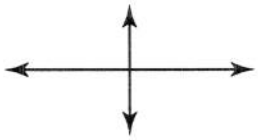
Obtuse angle
Greater than a right angle.



Parallel lines
Never intersect.



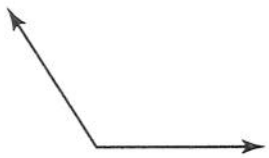
Intersecting lines
Pass through the same point.



Perpendicular lines
Lines that form right angles.

Use geometric terms to describe what is shown. Be as specific as possible.

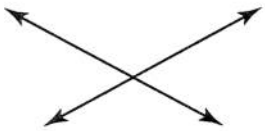
1.



_____

_____

2.



_____

_____

3.

_____

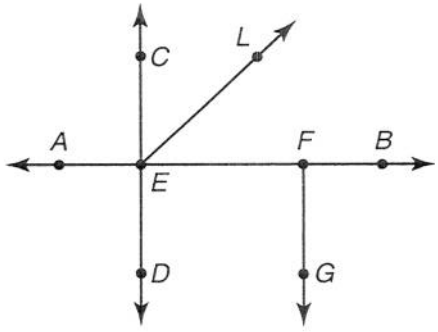
_____

4. Name three different rays.

_____

5. Name two different line segments.

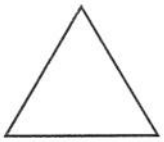
_____



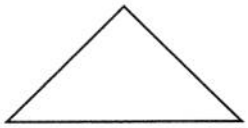
Name _____

Triangles and Quadrilaterals

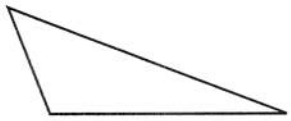
R 8-4



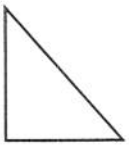
Equilateral triangle
All sides are the same length.



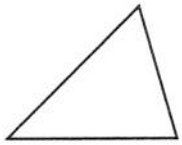
Isosceles triangle
At least two sides are the same length.



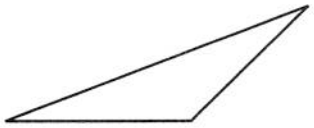
Scalene triangle
No sides are the same length.



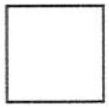
Right triangle
One angle is a right angle.



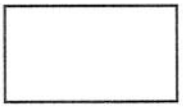
Acute triangle
All three angles are acute angles.



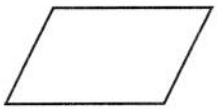
Obtuse triangle
One angle is an obtuse angle.



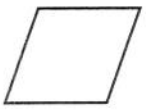
Square
There are four right angles. All sides are the same length.



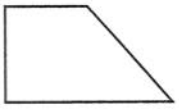
Rectangle
There are four right angles.



Parallelogram
Opposite sides are parallel.



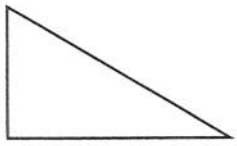
Rhombus
Opposite sides are parallel and all sides are the same length.



Trapezoid
There is only one pair of parallel sides.

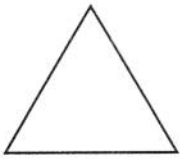
Classify each triangle by its sides and then by its angles.

1.



_____

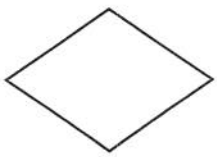
2.



_____

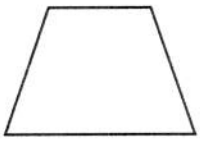
Write the name of each quadrilateral.

3.



_____

4.



_____

Name _____

Circles

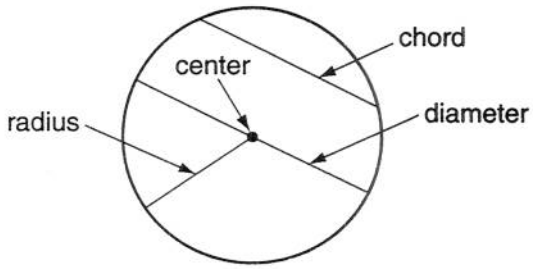
R 8-5

A circle is made up of all points that are the same distance from the center point.

A radius connects the center to any point on the circle.

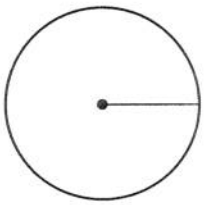
A chord connects any two points on the circle.

A diameter connects two points on the circle and passes through the center of the circle.



State whether the line segment shown is a radius, a chord, or a diameter.

1.



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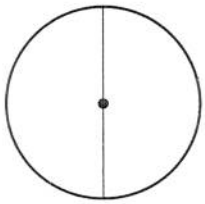
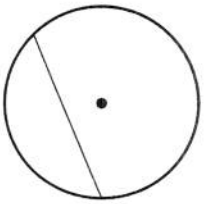
2.



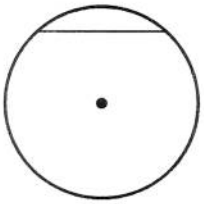
_____

3.



_____

4.



_____

5. Writing in Math How is a chord different from a radius?

_____

_____

_____

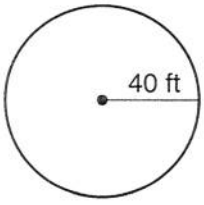
_____

For each circle shown, find the length of the diameter.

6.

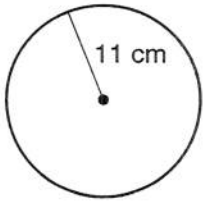
_____

7.



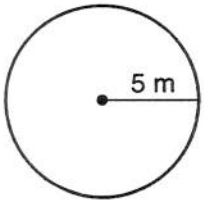
_____

8.



_____

9.



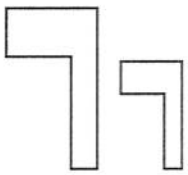
_____

Name _____

Congruent Figures and Motions

R 8-6

When two figures have the same shape and size, they are congruent.

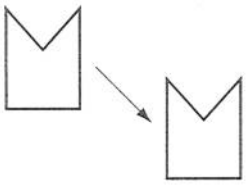


Not congruent
Different size.

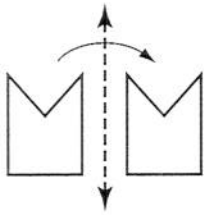
Congruent
Same size and shape.

Not congruent
Different shape and size.

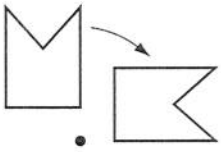
Figures can be moved in three ways: by slides, flips, or turns. When a figure is moved, its size and shape do not change.



Slide
Moves the figure in a straight direction.



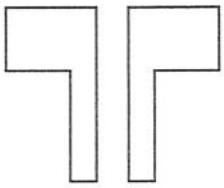
Flip
Gives the figure its mirror image. Sometimes the object looks the same after being flipped.



Turn
Moves a figure about a point.

Do the figures in each pair appear to be congruent? If so, tell if they are related by a flip, slide, or turn.

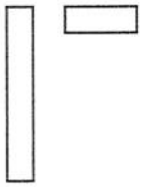
1.



_____

_____

2.



_____

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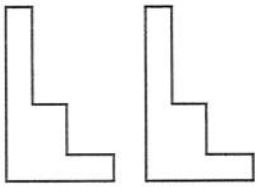
3.



_____

_____

4. Reasoning Could the letters L and M ever be congruent? Explain.

_____

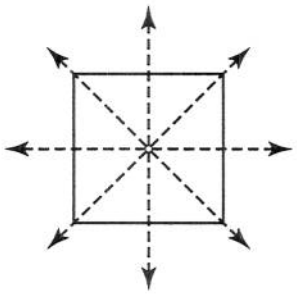
_____

Name _____

Symmetry

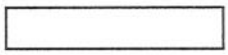
R 8-7

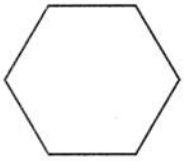
Symmetric figures are figures that can be folded to make two halves that are congruent to each other. The lines that divide a symmetric figure into congruent halves are called lines of symmetry.

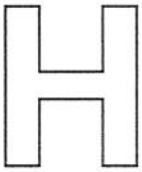


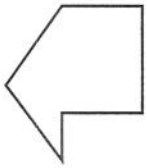
This square has 4 lines of symmetry. If you fold the square along any of the 4 dashed lines, the two halves will lie on top of each other.

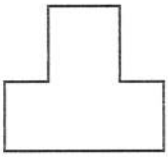
How many lines of symmetry does each figure have?

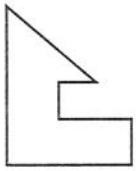
1.  _____

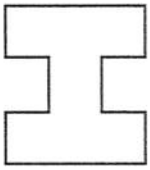
2.  _____

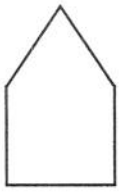
3.  _____

4.  _____

5.  _____

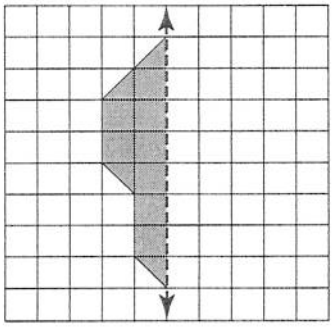
6.  _____

7.  _____

8.  _____

9. Reasoning How many lines of symmetry does the letter R have? _____

10. Complete the drawing so that the figure is symmetric.



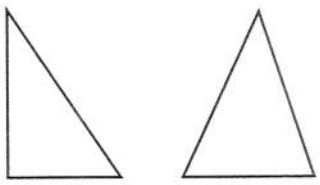
Name _____

Similar Figures

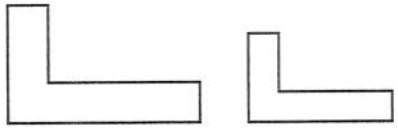
R 8-8

Similar figures are figures that have the same shape. The figures may or may not have the same size.

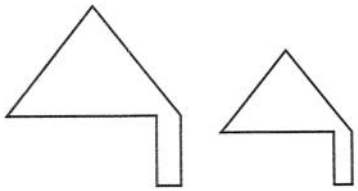
These triangles are about the same size, but they do not have the same shape. The triangles are NOT similar.



These shapes are similar. They have the same shape but are not the same size.



Do the figures in each pair appear to be similar? If so, are they also congruent?

1. 

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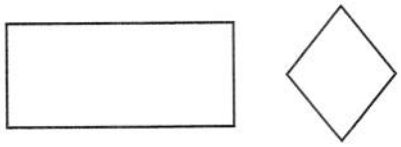
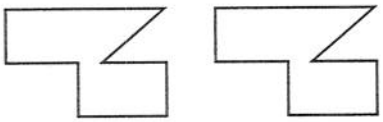
2. 

_____

3. 

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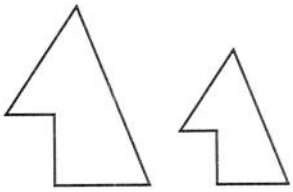
4. 

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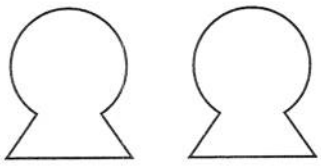
5. 

_____

6. 

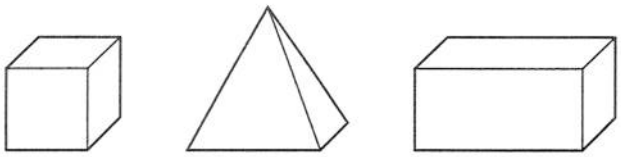
_____

Name _____

Writing to Describe

R 8-9

How would you describe the figures below?



Cube | **Rectangular pyramid** | **Rectangular prism**

Tips for writing a math description:

- Make a list of all the geometric terms that tell about or describe how the shapes are alike.
- Choose the terms to use in your answer.
- Use geometric terms correctly when you write your description.

Example

Geometric terms that describe how the shapes are alike:

solid figures

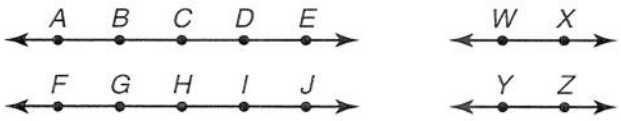
flat surfaces

have rectangular faces

Since all of the shapes have height, width, and depth, they are all solid figures. They all have flat surfaces, and each of them has at least one rectangular face. They all have edges and vertices.

---

1. Write two statements to describe how the pairs of lines are alike.



_____

_____

_____

2. Write three statements comparing rectangular prisms and rectangular pyramids.

_____

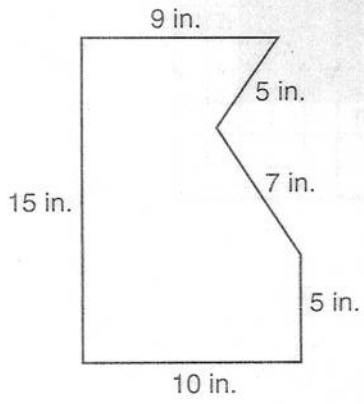
_____

Name _____

Perimeter

R 8-10

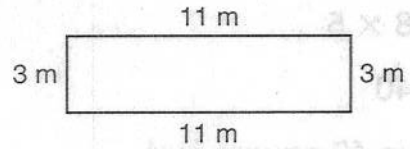
You can use addition to find the perimeter of a figure.



Add the lengths of the sides.

$9 + 5 + 7 + 5 + 10 + 15 = 51$ in.

Sometimes you can use a formula to find the perimeter.



$P = 2l + 2w$

l is the length and w is the width.

$P = 2l + 2w$

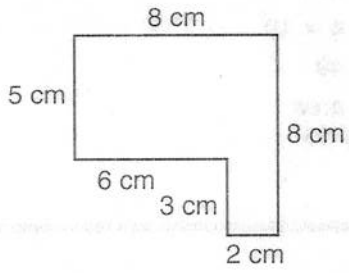
$P = (2 \times 11) + (2 \times 3)$

$P = 22 + 6$

$P = 28$ m

Find the perimeter of each figure.

1.



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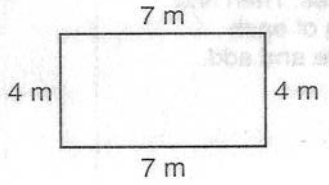
2.



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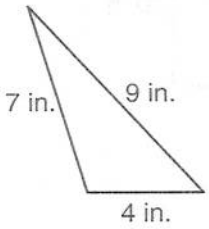
3.



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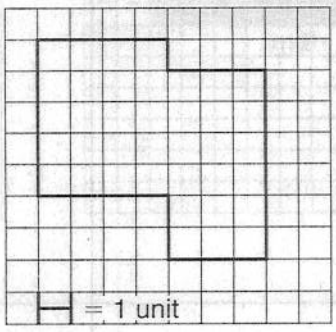
4.



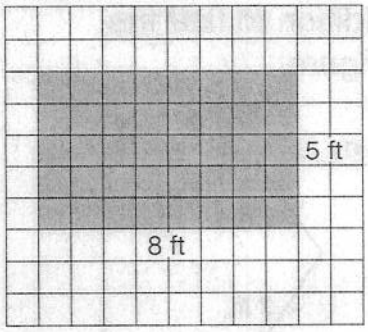
_____

Name _____

Area

R 8-11

What is the area of this rectangle?



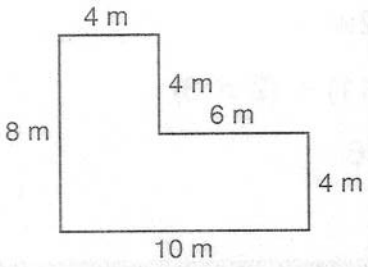
Use the formula $A = lw$:

$A = 8 \times 5$

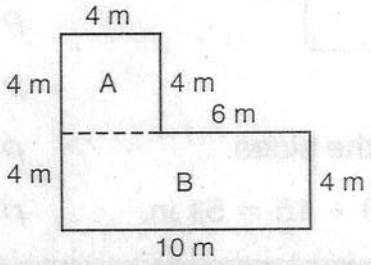
$A = 40$

The area is 40 square feet.

What is the area of this figure?



You can draw segments to divide the figure into rectangles. Then find the area of each rectangle and add.

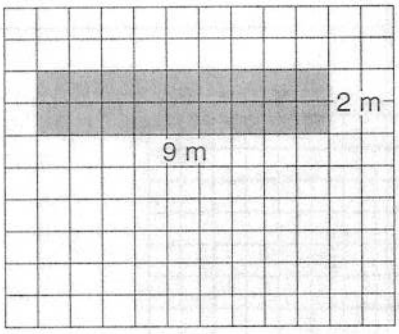


Rectangle A	Rectangle B
$A = lw$	$A = lw$
$A = 4 \times 4$	$A = 4 \times 10$
$= 16$	$= 40$

$16 + 40 = 56$, so the area of the original figure is 56 square meters.

Find the area of each rectangle.

1.



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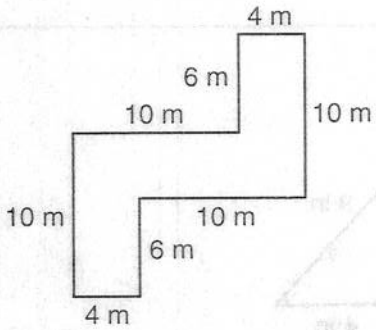
2.



_____

3. Reasoning The area of a rectangle is 56 square inches. The width of the rectangle is 7 in. What is the length? _____

Name _____

PROBLEM-SOLVING STRATEGY **R 8-12**

Act It Out

The Paper Marla wants to buy a newspaper from a newspaper vending machine on the street corner. The vending machine takes only nickels and dimes. The cost of the paper is $0.75. What is the fewest number of coins Marla can use to buy the paper?

Read and Understand

Step 1: What do you know?

A paper costs $0.75. The vending machine takes only nickels and dimes.

Step 2: What are you trying to find?

Find the least number of coins Marla will need.

Plan and Solve

Step 3: What strategy will you use?

Strategy: Act it out

Use coins to act it out. Combine different numbers of nickels and dimes to make $0.75. One combination is 5 dimes and 5 nickels, a total of 10 coins. The best combination is 7 dimes and 1 nickel, a total of 8 coins.

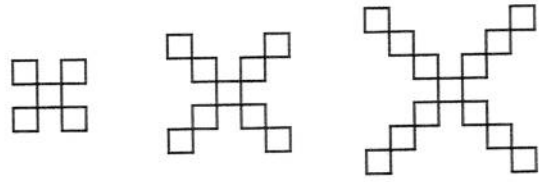
Look Back and Check

Step 4: Is your work correct?

Yes. Any combination must have at least 1 nickel since the amount needed for the paper ends in 5.

1. How many squares are needed to make the 6th design?

_____



Design 1 Design 2 Design 3

2. Tom and Toby each run every day. Tom runs 4 mi each day. Toby runs 5 mi every day. How many miles has Tom run when Toby has run 65 mi?

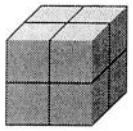
_____

Name _____

Volume

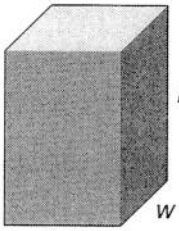
R 8-13

The number of cubic units needed to fill a solid figure is its volume. To find the volume of a solid figure, you can count each cube. The figure to the right has a volume of 8 cubic units.



You can also use multiplication to find the volume of a solid figure.

You can use the formula $V = lwh$.

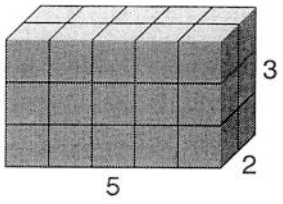


h = height of figure

w = width of figure

l = length of figure

Volume = length × width × height



$V = lwh$

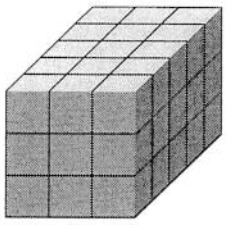
$V = 5 \times 2 \times 3$

$= 30$

The volume is 30 cubic units.

Find the volume of each figure.

1.



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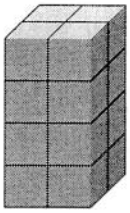
2.



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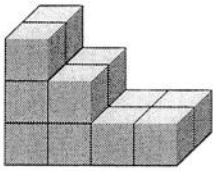

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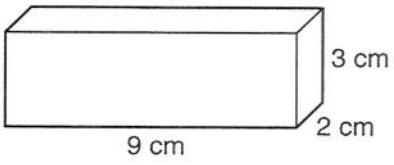


_____

5. Reasoning A box with dimensions 4 in. by 4 in. by 4 in. is placed inside a box with dimensions 6 in. by 6 in. by 6 in. How much space is left inside the larger box after the smaller box is put inside?

_____

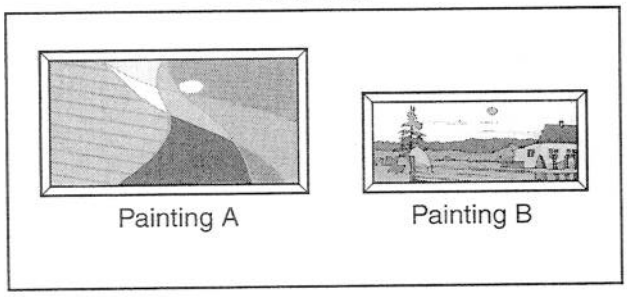
Name _____

PROBLEM-SOLVING APPLICATION **R 8-14**

The Living Room

Dana's parents are making some changes to their living room. The east wall of the living room has two different paintings.

East Wall



Painting A

Painting B

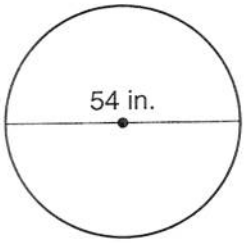
Are the paintings congruent?

No. They are the same shape but not the same size.

1. Dana's parents bought two round tables to be placed on each side of a couch. What is the diameter of Table X? What is the radius of Table Y?

Table X

Table Y



_____

_____

2. Are the tables similar, congruent, or both? Explain.

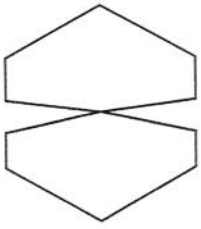
_____

_____

3. Dana's father thought it would be a good idea to move the living room rug. Was the rug moved by a slide, flip, or turn?

_____

4. Dana's mother made a special design on the floor using tile. How many lines of symmetry does the design have?



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