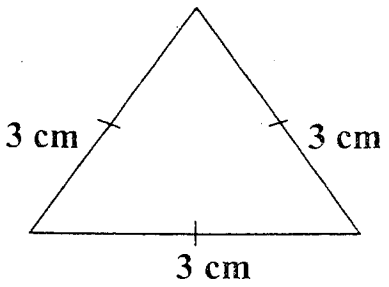
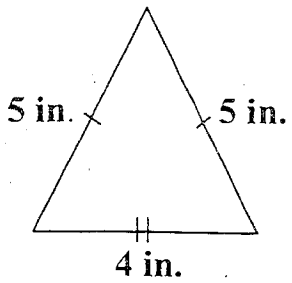
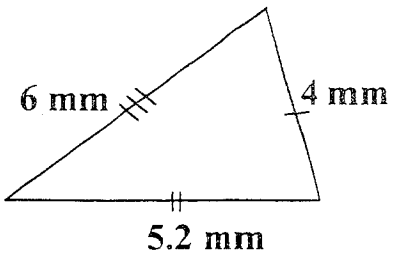
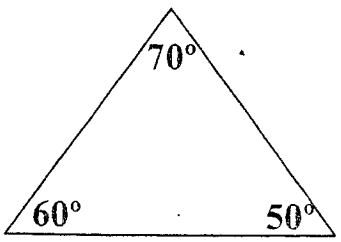
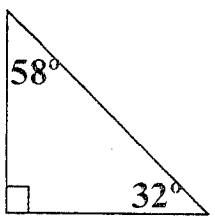
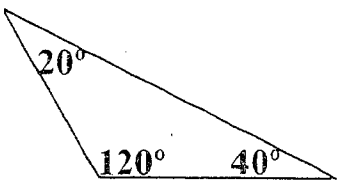
Classifying Triangles

- Triangles can be classified by the lengths of their sides.

Equilateral triangle	Isosceles triangle	Scalene triangle
		
Three equal sides.	Two equal sides.	No equal sides.

- The lengths of any two sides of a triangle must be greater than the length of the third side.
- Another word that describes equal sides is congruent, ≅.

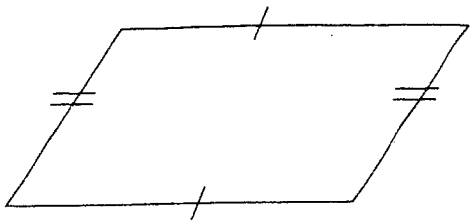
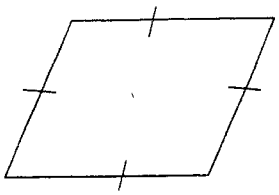
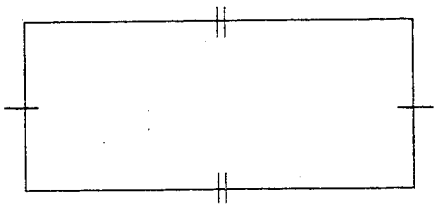
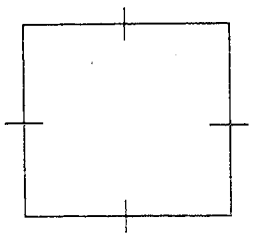
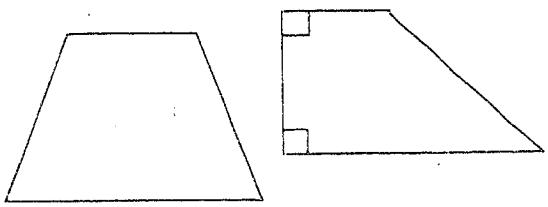
- Triangles can be classified by the measures of their angles.

Acute triangle	Right triangle	Obtuse triangle
		
Three acute angles.	One right angle.	One obtuse angle.

- Add the measures of the angles of all three triangles. What is the sum of the measures of the angles in triangles?

- Can a triangle have two right angles? Can a triangle have two obtuse angles? Explain your answer.

Classifying Quadrilaterals

A parallelogram is a polygon with <u>two pairs</u> of parallel sides. The opposite sides are equal in length.	
A rhombus has <u>four</u> congruent sides. ➔A rhombus is a parallelogram because it has <u>two pairs</u> of parallel sides.	
A rectangle has <u>four</u> right angles. ➔A rectangle is a parallelogram because it has <u>two pairs</u> of parallel sides.	
A square has <u>four</u> right angles. ➔A square is a parallelogram because it has <u>two pairs</u> of parallel sides. ➔A square is a rectangle because it has four right angles. ➔ A square is a rhombus because it has <u>four</u> congruent sides.	
A trapezoid has one <u>pair</u> of parallel sides.	

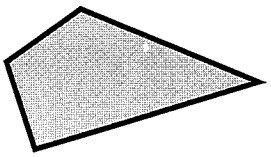
Name _____

Quick Check
8-3

1. How many vertices does an octagon have?

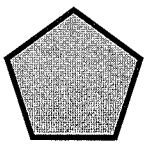
   A 6
   B 7
   C 8
   D 9

2. Which best describes the polygon?



   A a regular triangle
   B a regular quadrilateral
   C an irregular triangle
   D an irregular quadrilateral

3. **Writing to Explain** Anna is building a flower garden in the shape at the right.



   a. Name the polygon.

   _____

   b. How many sides and vertices does the polygon have?

   _____

   c. If one side of the garden is 5 ft, what is the perimeter of the garden?

   _____

   d. All the angles of the polygon are equal. If the total measure of the angles is 540°, how many degrees is each angle of the polygon?

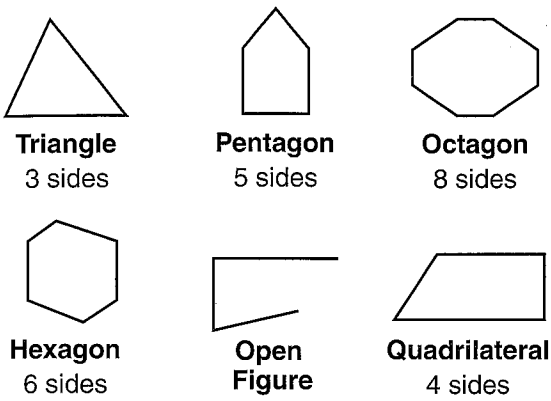
   _____

Name _____

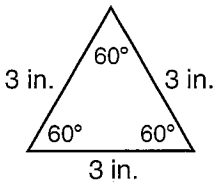
Reteaching
8-3

Polygons

A polygon is a closed plane figure made up of line segments. Common polygons have names that tell the number of sides the polygon has.

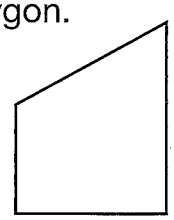


A **regular polygon** has sides of equal length and angles of equal measure.



Each side is 3 in. long.
Each angle is 60°.

Name each polygon. Then tell if it appears to be a regular polygon.

1. 

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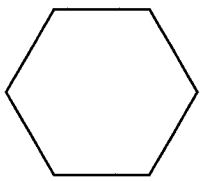
2. 

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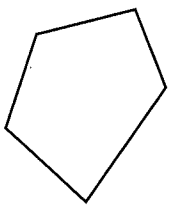
3. 

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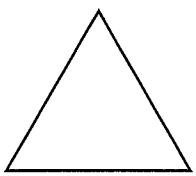
4. 

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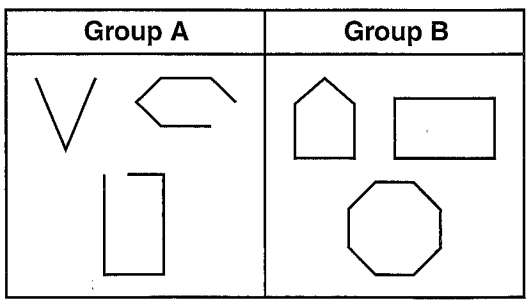
5. Reasoning Shakira sorted shapes into two different groups. Use geometric terms to describe how she sorted the shapes.



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_____

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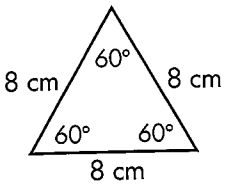
Name _____

Reteaching
8-4

Triangles

You can classify triangles by the lengths of their sides and the sizes of their angles.

acute
all angles less than 90°

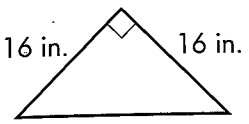


equilateral
all sides the same length

This triangle is both equilateral and acute.

Not all acute triangles are equilateral.

right
one right angle

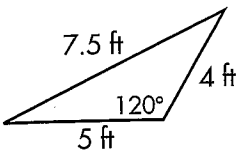


isosceles
two sides the same length

This triangle is both isosceles and right.

Not all right triangles are isosceles.

obtuse
one obtuse angle



scalene
no sides the same length

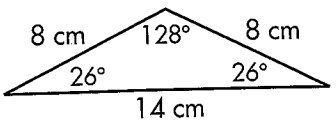
This triangle is both scalene and obtuse.

Not all obtuse triangles are scalene.

Remember that the sum of the measures of the angles of a triangle is 180°.

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

1.



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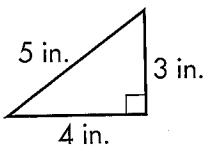
2.



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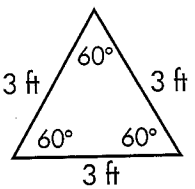
3.



_____

_____

The measures of two angles of a triangle are given. Find the measure of the third angle.

4. 40°, 100°, _____

5. 14°, 98°, _____

6. 38°, 38°, _____

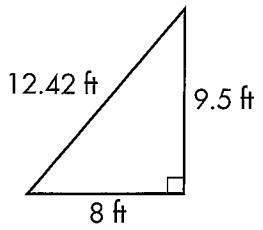
Name _____

Practice
8-4

Triangles

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

1.



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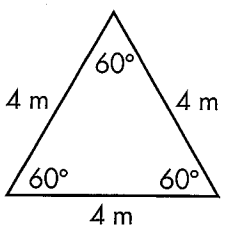
2.



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_____

The measures of two angles of a triangle are given. Find the measure of the third angle.

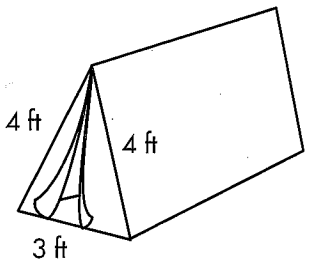
3. 47°, 62°, _____

4. 29°, 90°, _____

5. 75°, 75°, _____

6. 54°, 36°, _____

7. Judy bought a new tent for a camping trip. Look at the side of the tent with the opening to classify the triangle by its sides and its angles.



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8. Reasonableness Which describes a scalene triangle?

A 4 equal sides **B** 3 equal sides **C** 2 equal sides **D** 0 equal sides

9. Explain It The lengths of two sides of a triangle are 15 in. each. The third side measures 10 in. What type of triangle is this? Explain your answer using geometric terms.

_____

_____

Practice 8-4