

NAME \_\_\_\_\_

Module 8 Points, Lines, Angles, and Triangles

Lesson 4 Triangles

### Lesson Objectives

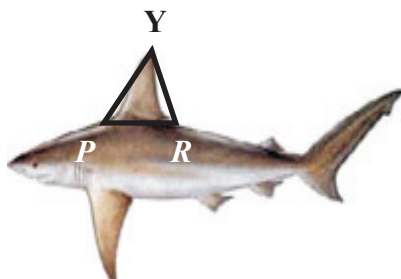
- Identify, describe, draw, and classify triangles as equilateral, isosceles, or scalene.
- Identify, describe, draw, and classify triangles as right, acute, obtuse, and equiangular.
- Use physical models and paper to determine the sum of the measures of interior angles of triangles.

### Subtopic 1 Defining Triangles

Triangle

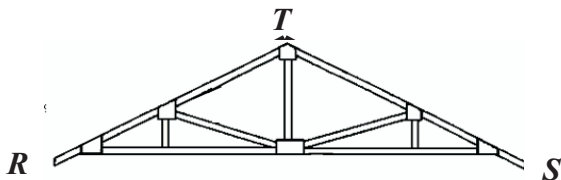
- **Closed** plane figure
- Three line segments (sides) joining three **noncollinear** points (vertices)

- 1 The dorsal fin of a sandbar shark is roughly triangular. For the triangle shown, name the sides, vertices, and angles. Write one name for the triangle.



Sides:  $\overline{PR}$ ,  $\overline{RY}$ ,  $\overline{YP}$   
 Vertices:  $P$ ,  $R$ ,  $Y$   
 Angles:  $\angle P$ ,  $\angle R$ ,  $\angle Y$   
 Name:  $\triangle PRY$

- 2 The frame of a roof truss is in the shape of a triangle. Name the triangle's sides, vertices, and angles. Give one name for the triangle.



Sides:  $\overline{TR}$ ,  $\overline{RS}$ ,  $\overline{ST}$   
 Vertices:  $S$ ,  $R$ ,  $T$   
 Angles:  $\angle T$ ,  $\angle R$ ,  $\angle S$   
 Name:  $\triangle TRS$

## Subtopic 2 Classifying Triangles

An acute triangle must have **three** acute angles.

A right triangle has one **right** angle.

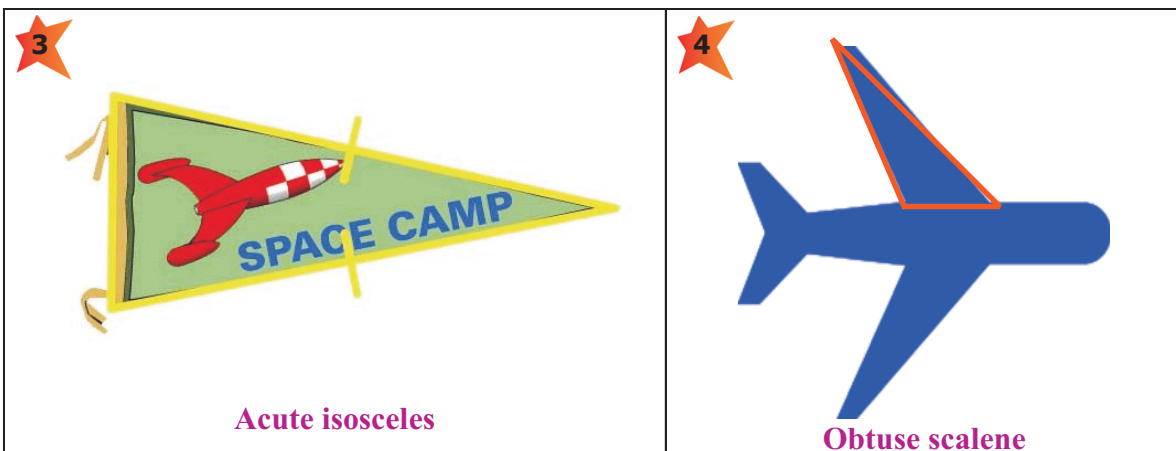
An **obtuse** triangle has one obtuse angle.

An **equilateral** triangle has three congruent sides.

An isosceles triangle has at least **two** congruent sides.

A **scalene** triangle has three non-congruent sides.

Classify the triangle by its sides and by its angles.



5 Sketch an example of each figure.

Obtuse isosceles triangle



Right scalene triangle



Acute scalene triangle



**Subtopic 3 Triangle Sum Property**

Triangle Sum Property

The sum of the measures of the three **interior** angles of any triangle is  **$180^\circ$** .

In  $\triangle ABC$ ,  **$m\angle A + m\angle B + m\angle C = 180^\circ$** .

An equiangular triangle has three **congruent** angles, each measuring  **$60^\circ$** .

If a triangle is equiangular, it is also **equilateral**.

- 6** A school is building a triangular garden. One interior angle measures  $58^\circ$ . Another measures  $82^\circ$ . What is the measure of the third interior angle?

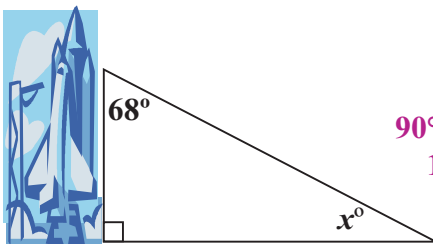
$$58^\circ + 82^\circ + x = 180^\circ$$

$$140^\circ + x = 180^\circ$$

$$x = 40^\circ$$

$$40^\circ$$

- 7** The gangway, or exit ramp, from a spaceship forms a  $68^\circ$  angle with the side of the ship. What angle does the gangway form with the ground?



$$90^\circ + 68^\circ + x = 180^\circ$$

$$158^\circ + x = 180^\circ$$

$$x = 22^\circ$$

**The gangway forms a  $22^\circ$  angle with the ground.**

- 8** Do these sets of angles form triangles? If so, are they acute, right, or obtuse?

$$30^\circ, 60^\circ, 90^\circ$$

$$100^\circ, 20^\circ, 40^\circ$$

$$45^\circ, 55^\circ, 80^\circ$$

$$30^\circ + 60^\circ + 90^\circ = 180^\circ$$

$$100^\circ + 20^\circ + 40^\circ = 160^\circ$$

$$45^\circ + 55^\circ + 80^\circ = 180^\circ$$

**Right triangle**

**No**

**Acute triangle**

