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ISOSCELES AND EQUILATERAL TRIANGLES

Unit 4 Lesson 5

ISOSCELES AND EQUILATERAL TRIANGLES

Students will be able to:

Identify the isosceles triangles and equilateral triangles based on the special properties of triangles.

Key Vocabulary

- **Isosceles Triangle**
- **Equilateral Triangle**

ISOSCELES AND EQUILATERAL TRIANGLES

What makes a normal triangle Isosceles or Equilateral?

We have studied four postulates that can be used to prove the congruence of two triangles.

- **Side-Side-Side Postulate (SSS)**
- **Side-Angle-Side Postulate (SAS)**
- **Angle-Side-Angle Postulate (ASA)**
- **Angle-Angle-Side Postulate (AAS)**

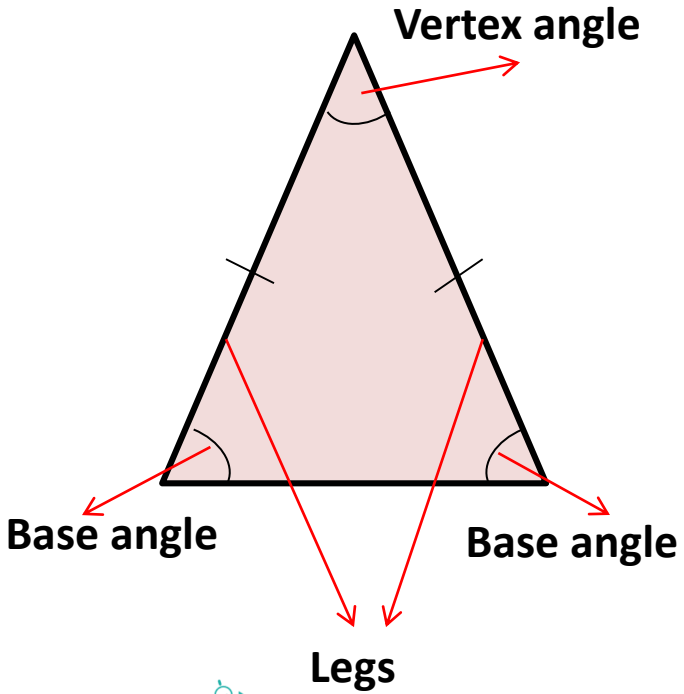
These theorems were based on the congruence of sides or angles of two triangles. In fact, within a triangle the congruence of sides or angles can lead to special triangles known as Isosceles and Equilateral triangles.

ISOSCELES AND EQUILATERAL TRIANGLES

Isosceles Triangle

An Isosceles triangle has two congruent sides.

- The two congruent sides are known as the **legs** of a triangle.
- The non-congruent side is known as the **base** of a triangle.
- The two angles adjacent to the base are known as the **base angles.**
- The angle opposite to the base is known as the **vertex** angle.



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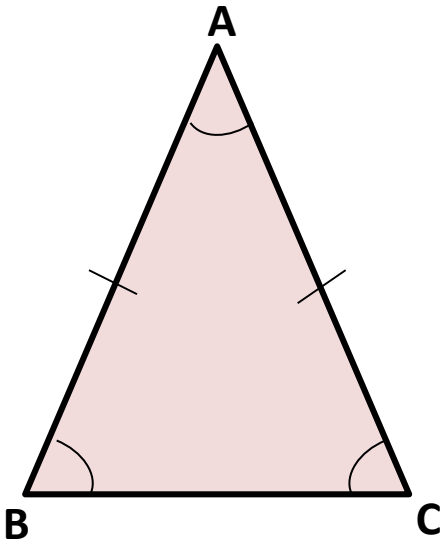
Base Angle Theorem:

If two sides of a triangle are congruent, then the corresponding base angles are also congruent.

If $AB \cong AC$, then $\angle B \cong \angle C$



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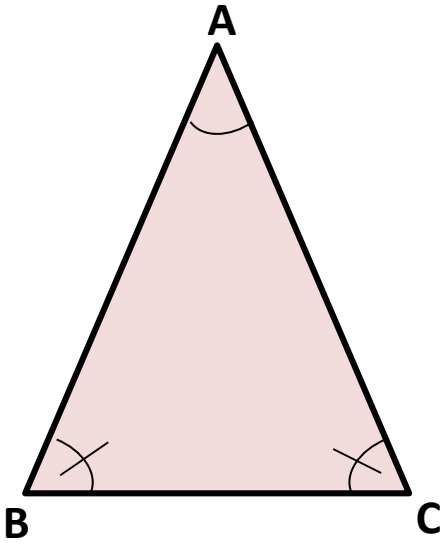
Converse of Base Angle Theorem:

If two base angles of a triangle are congruent, then the two legs of a triangle are also congruent.

If $\angle B \cong \angle C$, then $AB \cong AC$



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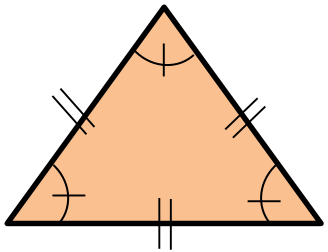
Equilateral Triangle

An Equilateral triangle has all the three sides congruent.



Since all the sides of the triangle are same, all the interior angles are also equal, so an equilateral triangle is also an equiangular triangle.

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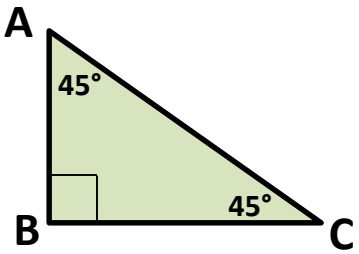
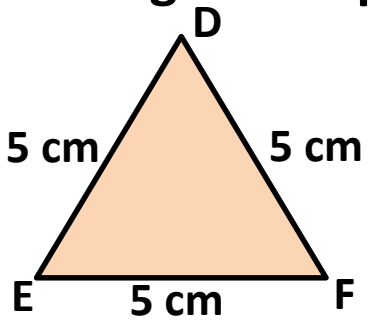
Problem 1: Identify which of these triangles is equilateral and which is isosceles?





In ΔABC, $\angle \mathbf{A} \cong \angle \mathbf{C} = 45°$, so

ΔABC is Isosceles

In ΔDEF, $\mathbf{DE} \cong \mathbf{DF} \cong \mathbf{EF} = 5$ cm, so

ΔDEF is Equilateral