

6th – Triangles

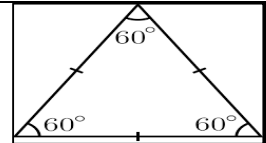


Polygons: A polygon is a closed figure made by joining three or more line segments (not curves), where each line segment intersects exactly two other line segments. If all sides of a polygon are equal and all angles are also equal, then it is called a regular polygon.

Triangles: A triangle is a closed figure made of three line segments. A triangle is a three-sided polygon. It is denoted by Δ . The region inside the triangle is called its interior region.

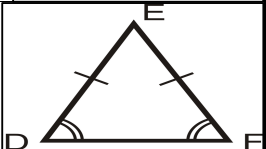
Types of triangles based on sides:

Equilateral triangle: when all the three sides of a triangle are equal it is called an equilateral triangle.



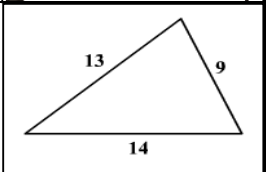
Isosceles triangle:

If two sides of a triangle are equal in length, then it is called an isosceles triangle.



Scalene triangle

A triangle having no two sides equal is called a scalene triangle.



Based on magnitude of the angles:

Acute- angled triangle: If each of the three angles of a triangle is acute, it is called an acute- angled triangle.

Right- angled triangle: When one angle of a triangle is a right angle, the triangle is called a right- angled triangle or simply a right triangle.

Obtuse- angled triangle: When one of the angles of a triangle is obtuse, it is called an obtuse- angled triangle or simply an obtuse triangle.

Equiangular triangle: When the three angles of a triangle are equal, the triangle is known as an equiangular triangle.

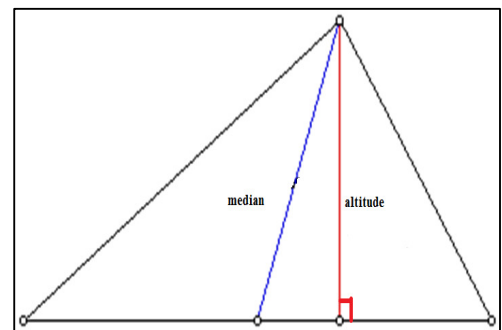
Sum of three angles of a triangle is equal to 180° .

Sum of lengths of any two sides of a triangle is greater than the third side.

When we produce the sides of a triangle in order, we get three exterior angles.

Median of a triangle: The line segment joining a vertex of a triangle to the mid- point of the opposite side is called a median.

Altitude of a triangle: An altitude of a triangle has one end point on a vertex and the other can be on the line containing the opposite side. A triangle has three altitudes.



1. Classify the following triangles as scalene, isosceles, or equilateral according to the length of their sides.

(a) 30 cm, 20 cm, 15 cm

(b) 8m, 12m, 8 m

(c) 16m, 16m, 16m

(d) 15 m, 12 m, 15 m

(e) 7 m, 9 m, 11 m

(f) 6 cm, 5 cm, 8 cm

2. Classify the following triangles as acute-angled, right-angled, or obtuse-angled triangles according to the magnitude of their angles.

(a) 40°, 60°, 80°

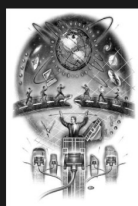
(b) 15°, 75°, 90°

(c) 10°, 20°, 150°

(d) 60°, 60°, 60°

(e) 70°, 70°, 40°

3. Can you construct a triangle with angles 70°, 40° and 60°. Why or Why not?



6th – Triangles

4. Two angles of a triangle are 45° and 60° . Find the third angle.
5. Can you construct a triangle using sides 7cm, 6cm, 12cm.
6. The angles of $\triangle ABC$ are in the ratio $\angle A: \angle B: \angle C = 1:2:3$. Find the magnitude of each angle.
7. Triangle PQR is a right-angled triangle, right-angled at R. $RS \perp PQ$. $\angle Q = 35^\circ$. Find the magnitude of $\angle PRS$, $\angle QRS$, and $\angle RPS$.
8. Two angles of a triangle are 35° and 50° , What type of triangle is formed?
9. The measure of angles of a triangle is in the ratio 2:3:5. What is the measure of the smallest angle?
10. The perimeter of a triangle is 72 meters. The sides are in the ratio 3:4:5. Find the length of the longest side.
11. One of the angles of an isosceles triangle is 110° . What are the measures of the other two equal angles?
12. The sum of the measures of two angles is 120 degrees. The ratio of the measures of the angles is 1:2. Find the measures of each angle.
13. Fill in the blanks:
 - a) The three _____ of a triangle are non-collinear.
 - b) Side opposite to the vertex C of $\triangle ABC$ is _____.
 - c) Vertex opposite to the side XZ of $\triangle XYZ$ is _____.
 - d) The other two angles of right - angled triangle are _____.
 - e) Each angle of an equilateral triangle measures _____ degrees.
14. Find the value of x and y:
15. Find the value of x:

