The Triangles and its Properties

1. A triangle is a figure made up by three line segments joining, in pairs, three non-collinear points. That is, if A, B, C are three non-collinear points, the figure formed by three line segments AB, BC and CA is called a triangle with vertices A, B, C.

2. The three line segments forming a triangle are called the sides of the triangle.

3. The three sides and three angles of a triangle are together called the six parts or elements of the triangle.

4. A triangle whose two sides are equal, is called an isosceles triangle.

5. A triangle whose all sides are equal, is called an equilateral triangle.

6. A triangle whose no two sides are equal, is called a scalene triangle.

7. A triangle whose all the angles are acute is called an acute triangle.

8. A triangle whose one of the angles is a right angle is called a right triangle.

9. A triangle whose one of the angles is an obtuse angle is called an obtuse triangle.

10. The interior of a triangle is made up of all such points P of the plane, as are enclosed by the triangle.

11. The exterior of a triangle is that part of the plane which consists of those points Q, which are neither on the triangle nor in its interior.

12. The interior of a triangle together with the triangle itself is called the triangular region.

13. The sum of the angles of a triangle is two right angles or 180°.

14. If a side of a triangle is produced, the exterior angle so formed is equal to the sum of the interior opposite angles.

15. In any triangle, an exterior angle is greater than either of the interior opposite angles.

16. The sum of any two sides of a triangle is greater than the third side.

17. In a right triangle, if a, b are the lengths of the sides and c that of the hypotenuse, then

$c^2 = a^2 + b^2$

18. If the sides of a triangle are of lengths a, b and c such that $c^2 = a^2 + b^2$, then the triangle is right-angled and the side of length c is the hypotenuse.

19. Three positive numbers a, b, c in this order are said to form a Pythagorean triplet, if $c^2 = a^2 + b^2$. Triplets (3, 4, 5) (5, 12, 13), (8, 15, 17), (7, 24, 25) and (12, 35, 37) are some Pythagorean triplets.