# Distance Formula

1. The distance between $P(x_1, y_1)$ and $Q(x_2, y_2)$ is $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.
    This is known as the **distance formula**.

2. The distance of a point $P(x, y)$ from origin is $\sqrt{x^2 + y^2}$.

3. The points A, B and C are **collinear** if AB + BC = AC.

4. Three points A, B and C are the vertices of an equilateral triangle if AB = BC = CA.

5. The points A, B and C are the vertices of an isosceles triangle if AB = BC or BC = CA or CA = AB.

6. Three points A, B and C are the vertices of a right triangle if sum of squares of any two sides is equal to the square of the third side.

7. For the given four points A, B, C and D:
    a. AB = BC = CD = DA; AC = BD $\Rightarrow$ ABCD is a square.
    b. AB = BC = CD = DA; AC $\neq$ BD $\Rightarrow$ ABCD is a rhombus.
    c. AB = CD, BC = DA; AC = BD $\Rightarrow$ ABCD is a rectangle.
    d. AB = CD, BC = DA; AC $\neq$ BD $\Rightarrow$ ABCD is a parallelogram.

8. **Circumcentre** is the point of intersection of the perpendicular bisectors of the sides of the triangle.
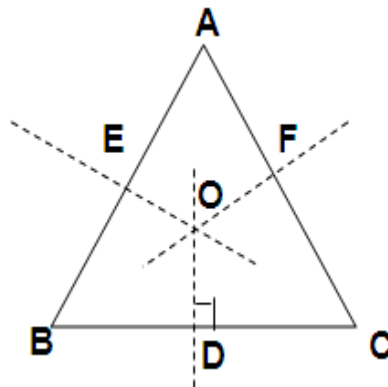
O is the circumcentre of the triangle ABC.