

NCERT Solutions for Class 9 Maths Chapter 7 Triangles Ex 7.5

Question 1.

ABC is a triangle. Locate a point in the interior of ΔABC which is equidistant from all the vertices of ΔABC .

Solution.

Circum centre of a triangle is always equidistant from all the vertices of that particular triangle.

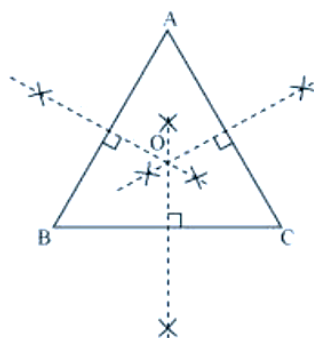
Circum centre is the point where perpendicular bisectors of all the sides of the triangle meet together.

In ΔABC , we can find the circum centre by drawing the perpendicular bisectors of sides AB, BC, and CA of this triangle.

O is the point where these bisectors are meeting together.

Therefore,

O is the point which is equidistant from all the vertices of ΔABC



Question 2.

In a triangle locate a point in its interior which is equidistant from all the sides of the triangle.

Solution.

The point which is equidistant from all the sides of a triangle is called the in centre of the triangle.

In centre of a triangle is the intersection point of the angle bisectors of the interior angles of that triangle.

Here,

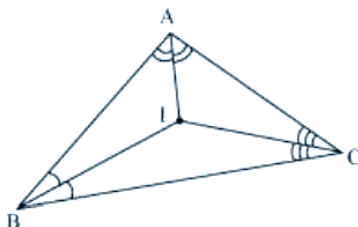
In $\triangle ABC$, we can find the in centre of this triangle by drawing the angle bisectors of the interior angles of this triangle.

I is the point where these angle bisectors are intersecting each other.

Therefore,

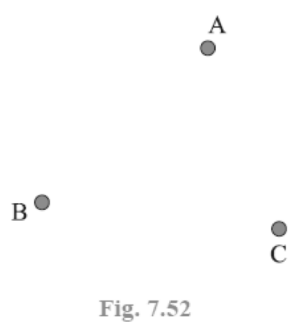
I is the point equidistant from all

the sides of $\triangle ABC$.



Question 3.

In a huge park, people are concentrated at three points (see figure):



A: Where there are different slides and swings for children,

B: Near which a man-made lake is situated,

C: Which is near to a large parking and exit?

Where should an ice cream parlour be set up so that maximum number of persons can approach it?

(Hint: The parlour should be equidistant from A, B and C)

Solution.

Maximum number of persons can approach the ice-cream parlour if it is equidistant from A, B and C.

Now,

A, B and C form a triangle.

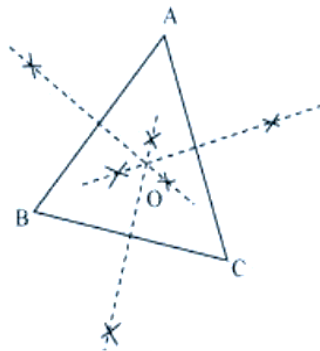
In a triangle, the circum centre is the only point that is equidistant from its vertices.

So, the ice-cream parlour should be set up at the circum centre O of $\triangle ABC$

In this situation,

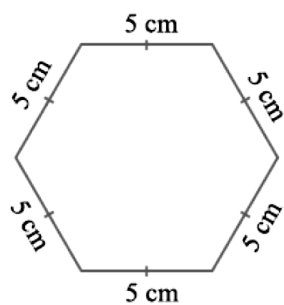
Maximum number of persons can approach it.

We can find circum centre O of this triangle by drawing perpendicular bisectors of the sides of this triangle

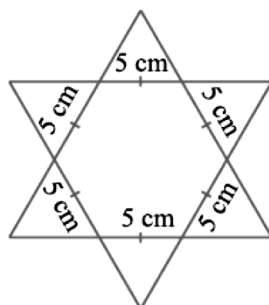


Question 4.

Complete the hexagonal and star shaped Rangolies (see figure (i) and (ii)) by filling them with as many equilateral triangles of side 1 cm as you can. Count the number of triangles in each case. Which has more triangles?



(i)



(ii)

Solution.

It can be observed that hexagonal-shaped rangoli has 6 equilateral triangles in it

$$\text{Area of } \triangle AOB = \frac{\sqrt{3}}{4} (\text{Side})^2$$

$$= \frac{\sqrt{3}}{4} (5)^2$$

$$= \frac{\sqrt{3}}{4} * 25$$

$$= \frac{25\sqrt{3}}{4} \text{ cm}^2$$

$$\text{Area of hexagonal shaped rangoli} = 6 * \frac{25\sqrt{3}}{4}$$

$$= \frac{75\sqrt{3}}{2} \text{ cm}^2$$

$$\text{Area of equilateral triangle having its side as 1 cm} = \frac{\sqrt{3}}{4} (1)^2$$

$$= \frac{\sqrt{3}}{4} \text{ cm}^2$$

Number of equilateral triangle of 1 cm side that can be filed in this

$$\text{hexagonal shaped rangoli} = \frac{\frac{75\sqrt{3}}{2}}{\frac{\sqrt{3}}{4}} = 150$$

Star shaped rangoli has 12 equilateral triangles of side 5 cm in it

$$\text{Area of star shaped rangoli} = 12 * \frac{\sqrt{3}}{4} * (5)^2$$

$$= 75\sqrt{3}$$

Number of equilateral triangles of 1 cm side that can be filled in this

$$\text{star shaped rangoli} = \frac{75\sqrt{3}}{\frac{\sqrt{3}}{4}}$$

$$= 300$$

Therefore, star shaped rangoli has more equilateral triangles in it

