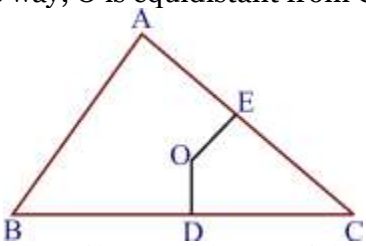
Triangles: Exercise 7.5

Q.1 ABC is a triangle. Locate a point in the interior of ΔABC which is equidistant from all the vertices of ΔABC.

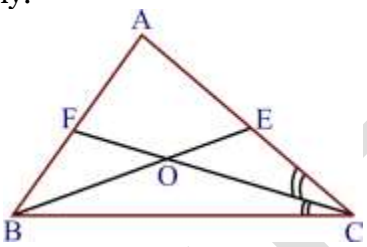
Sol. Suppose, OD and OE are the perpendicular bisectors of sides BC and CA respectively of ΔABC.
So, O is equidistant from two ends B and C of line segment BC because O lies on the perpendicular bisector of BC. In the same way, O is equidistant from C and A.



Therefore, the point of intersection O of the perpendicular bisectors of sides BC, CA and AB. So, O is the required point which is equidistant from vertices A, B and C of Δ ABC.

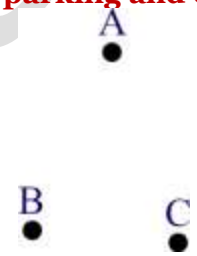
Q.2 In a triangle locate a point in its interior which is equidistant from all the sides of the triangle.

Sol. Suppose, BE and CF are the angle bisectors of ∠ABC and ∠ACB respectively and intersect the sides AC and AB at E and F respectively.



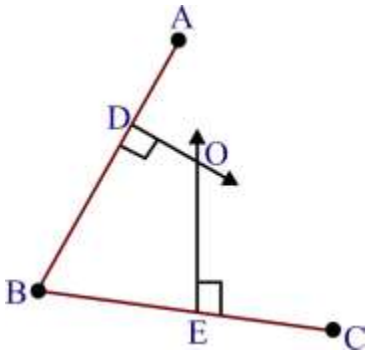
Since, point O lies on BE which bisect the ∠ABC. Hence, O will be equidistant from AB and BC. Similarly, O lies on the bisector CF of ∠ACB. So, O will be equidistant from BC and AC.
Thus, point O will be equidistant from sides AB, BC and CA.

Q.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.



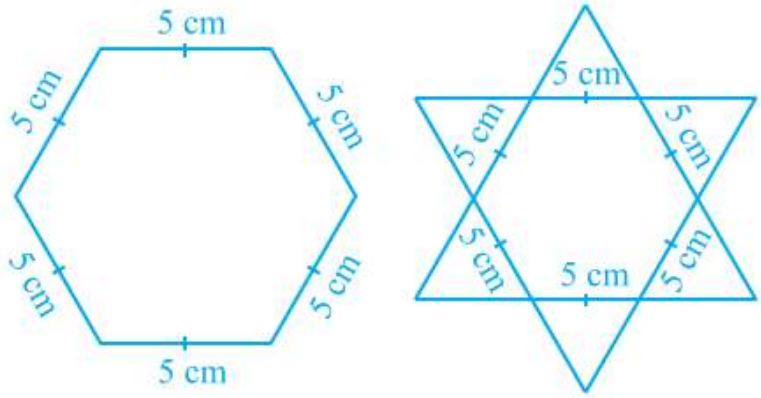
Where should an ice-cream parlour be set up so that maximum number of persons can approach it?

Sol. Firstly, we join the line AB and BC.



Since, ice-cream parlour should be equidistant from A, B and C. For which the point of intersection of perpendicular bisector should be located. So, draw the perpendicular bisector of line AB and BC which intersect at point O.
Hence, O is the required point which is equidistant from A, B and C.

Q.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?



Sol. In activity of filling each figure with equilateral triangles of side 1 cm, we find that figure- (i) number of such triangles is 150. (ii) Number of such triangle is 300.
So, figure (ii) has more triangles.