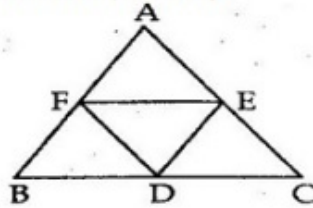Exercise 9C

Question 8:

Given : A triangle ABC in which D, E and F are the mid points of BC, AC and AB respectively.

To prove : $\angle EDF = \angle A$

$\angle DEF = \angle B$

and $\angle DFE = \angle C$

Proof :

Midpoint Theorem: The line segment joining the midpoints of any two sides of a triangle is parallel to the third side and equal to half of it.

In $\triangle AFE$ and $\triangle DFE$

$AF = \dfrac{1}{2}AB = ED$ [By Mid point Theorem]

$AE = \dfrac{1}{2}AC = FD$ [By Mid point Theorem]

$FE = EF$ [Common]

Thus by Side-Side-Side criterion of congruence, we have

$\triangle AFE \cong \triangle DFE$ [By SSS]

The corresponding parts of the congruent triangles are equal.

$\therefore$ $\angle A = \angle FDE$ [C.P.C.T.]

Similarly we can prove that

$\angle B = \angle DEF$

and $\angle C = \angle DFE$.

********** END *********