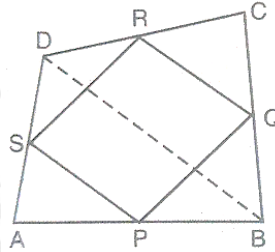## MID – POINT AND INTERCEPT THEOREMS

1. Prove that the figure formed by joining the mid-points of the consecutive sides of a quadrilateral is a parallelogram.


2. The diagonals of a quad. ABCD are perpendicular, Show that the quadrilateral, formed by joining the mid-points of its sides is a rectangle.

3. Show that the quadrilateral formed by joining the mid-points of the sides of a square, is also a square.

4. Given ΔABC, lines are drawn through A, B and c parallel respectively to the sides BC, CA and AB forming ΔPQR. Show that. BC $= \frac{1}{2}$ QR

5. ABC is a triangle right angled at B and P is the mid-pt. of AC. Prove that PB =PA = AC $\frac{1}{2}$ AC

6. In the figure, ABCD is a trapezium in which side AB ∥ side DC and E is the mid-point of the side AD. If G is a point on the side BC such that the segment EG ∥ DC, show that EG $= \frac{1}{2}$ (AB + DC)
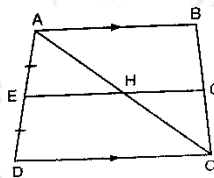
7. In a △ABC, if a set of lines PX, QY, RZ, ST drawn parallel to BC, divide one side AB into 5 equal parts, they also divide the other side AC into 5 equal parts.

   Also, PX $= \frac{1}{5}$ BC, QY $= \frac{2}{5}$ BC, RZ $= \frac{3}{5}$ BC, ST$= \frac{4}{5}$ BC.

8. M and N divide the side AB of a △ABC into three equal parts. Line segments MP and NQ are both parallel to BC and meet AC in P and Q respectively. Prove that P, Q divides AC into three equal parts.

9. In the figure AD is the median and DE∥AB. Prove that BE is the median.
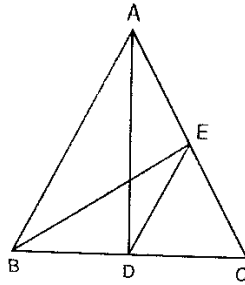
10. In △ABC, AD is the median through A and E is the mid-point of AD.BE produced meets
AC in F. Prove that AF=$\frac{1}{3}$ AC.