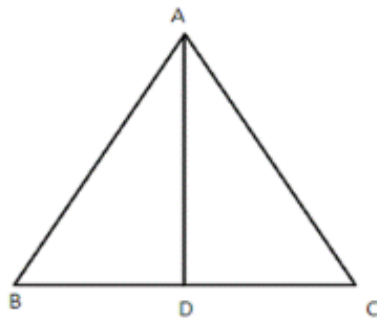Exercise 5A

Question 41:

Given: A $\triangle ABC$ in which AC> AB and AD is a bisector of $\angle A$

To prove: $\angle ADC \; > \; \angle ADB$

Proof :   Since AC > AB

$\Rightarrow \quad \angle ABC \; > \; \angle ACB$

Adding $\frac{1}{2}\angle A$ on both sides of inequality.

$\angle ABC + \frac{1}{2}\angle A > \angle ACB + \frac{1}{2} \angle A$

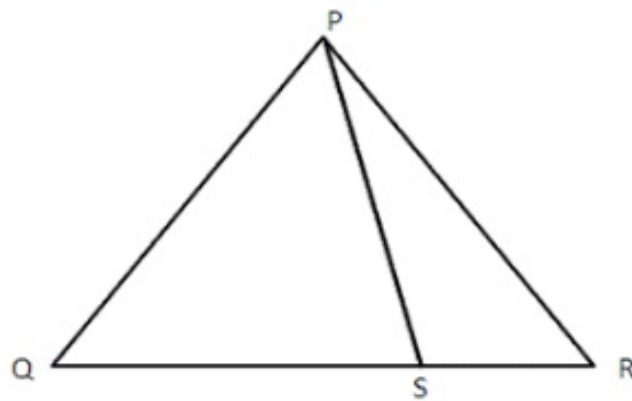$\Rightarrow \quad \angle ABC + \angle BAD > \angle ACB + \angle DAC$

$[\because AD \text{ is a bisector of } \angle A]$

$\Rightarrow \quad$ Exterior $\angle ADC >$ Exterior $\angle ADB$

$\therefore \qquad \angle ADC \; > \; \angle ADB.$

Question 42:

Given :   A triangle PQR and S is a point on QR.

To prove: PQ + QR + RP >2PS
Proof: Since in a triangle, sum of any two
sides is always greater than the third side.
So in ΔPQS, we have
        PQ+ QS> PS   ....(i)
Similarly, in ΔPSR, we have
        PR + SR> PS   ...(ii)
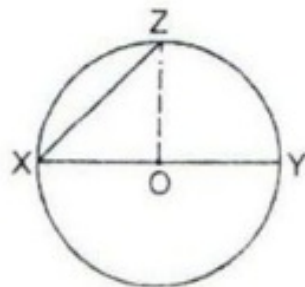Adding both sides of (i) and (ii) , we get.
        PQ + QS + PR + SR > 2PS
$\Rightarrow$ PQ + PR + QS + SR > 2PS
$\Rightarrow$ PQ + PR + QR   > 2PS

Question 43:

Given : A circle with centre O is drawn in which
XY is a diameter and XZ is a chord.
To prove :   XY> XZ
Proof :   In ΔXOZ, we have,
            OX+OZ > XZ
[∴ sum of any two sides in a triangle is a
                            greater than its third side]
$\Rightarrow$ OX +OY > XZ
[∵   OZ = OY, radius of the circle]
∴   XY > XZ
[∵   OX+OY=XY]

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