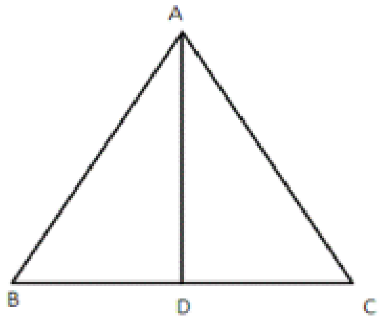
Exercise 5A

Question 41:

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



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

Proof : Since $AC > AB$

$\Rightarrow \angle ABC > \angle ACB$

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

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

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

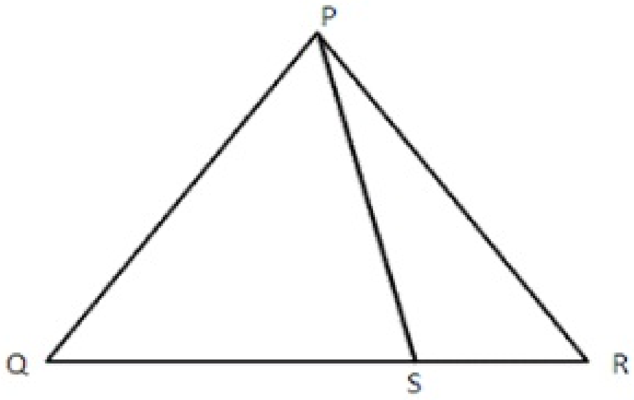
[$\because$ AD is a bisector of $\angle A$]

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

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

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)

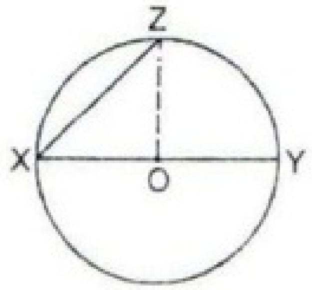
Adding both sides of (i) and (ii) , we get.

$PQ + QS + PR + SR > 2PS$

$\Rightarrow PQ + PR + QS + SR > 2PS$

$\Rightarrow PQ + PR + QR > 2PS$

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,

$OX + OZ > XZ$

[$\therefore$ sum of any two sides in a triangle is a greater than its third side]

$\Rightarrow OX + OY > XZ$

[$\because$ OZ = OY, radius of the circle]

$\therefore XY > XZ$

[$\because OX + OY = XY$]

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