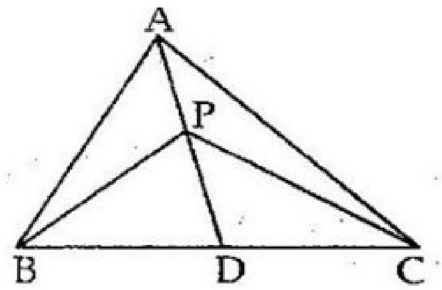
Exercise 10A

Question 15:

Given: A $\triangle ABC$ in which AD is the median and P is a point on AD.



To Prove: (i) $ar(\triangle BDP) = ar(\triangle CDP)$

(ii) $ar(\triangle ABP) = ar(\triangle APC)$

Proof: (i) In $\triangle BPC$, PD is the median. Since median of a triangle divides the triangle into two triangles of equal areas

So, $ar(\triangle BPD) = ar(\triangle CDP)$......(1)

(ii) In $\triangle ABC$, AD is the median

So, $ar(\triangle ABD) = ar(\triangle ADC)$

But, $ar(\triangle BPD) = ar(\triangle CDP)$ [from (1)]

Subtracting $ar(\triangle BPD)$ from both the sides of the equation, we have

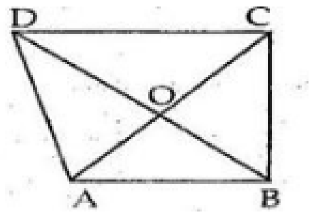
$\therefore ar(\triangle ABD) - ar(\triangle BPD) = ar(\triangle ADC) - ar(\triangle BPD)$

$= ar(\triangle ADC) - ar(\triangle CDP)$ from (1)

$\Rightarrow ar(\triangle ABP) = ar(\triangle ACP)$.

Question 16:

Given: A quadrilateral ABCD in which diagonals AC and BD intersect at O and BO = OD



To Prove : $ar(\Delta ABC) = ar(\Delta ADC)$

Proof: Since $OB = OD$ [Given]

So, AO is the median of ΔABD

$\therefore \quad ar(\Delta AOD) = ar(\Delta AOB) \quad ....(i)$

As OC is the median of ΔCBD

$ar(\Delta DOC) = ar(\Delta BOC) \quad .....(ii)$

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

$ar(\Delta AOD) + ar(\Delta DOC) = ar(\Delta AOB) + ar(\Delta BOC)$

$\therefore \quad ar(\Delta ADC) = ar(\Delta ABC)$

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