Triangles Ex 4.6 Q11

Answer :

Given: ΔABC and ΔDBC are on the same base BC. AD and BC intersect at O.

Prove that: $\dfrac{Ar(\Delta ABC)}{Ar(\Delta DBC)}=\dfrac{AO}{DO}$

Construction: Draw $AL\perp BC$ and $DM\perp BC$.

Now, in ΔALO and ΔDMO, we have

$\angle ALO=\angle DMO=90°$

$\angle AOL=\angle DOM$ (vertically opposite angles)

Therefore $\Delta ALO\sim\Delta DMO$

$\therefore\ \frac{AL}{DM}=\frac{AO}{DO}$ (Corresponding sides are proportional)

$$\frac{Ar(\Delta\ ABC)}{Ar(\Delta\ BCD)}=\frac{\frac{1}{2}\times BC\times AL}{\frac{1}{2}\times BC\times DM}$$
$$=\frac{AL}{DM}$$
$$=\frac{AO}{DO}$$

Triangles Ex 4.6 Q12

Answer :

Given: ABCD is a trapezium in which AB || CD.

The diagonals AC and BD intersect at O.

To prove:

(i) $\Delta AOB\sim\Delta COD$

(ii) If OA = 6 cm, OC = 8 cm

To find:

(a) $\dfrac{ar(\Delta AOB)}{ar(\Delta COD)}$

(b) $\dfrac{ar(\Delta AOD)}{ar(\Delta COD)}$

Construction: Draw a line MN passing through O and parallel to AB and CD

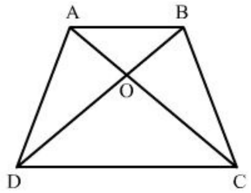
(i) Now in ΔAOB and ΔCOD

$\angle OAB=\angle OCD$ (Alternate angles)

$\angle OBA=\angle ODC$ (Alternate angles)

$\angle AOB=\angle COD$ (vertically opposite angle)

$\Rightarrow\Delta AOB\sim\Delta COD$ (A.A.Acrieteria)



(*ii*) (*a*)We know that the ratio of areas of two similar triangles is equal to the ratio of squares of their corresponding sides.

$$\frac{ar(\Delta AOB)}{ar(\Delta COD)}=\left(\frac{OA}{OC}\right)^2$$

$$=\left(\frac{6}{8}\right)^2$$

$$\boxed{\frac{ar(\Delta AOB)}{ar(\Delta COD)}=\frac{9}{16}}$$

(*b*)We know that the ratio of areas of two similar triangles is equal to the ratio of squares of their corresponding sides.

$$\frac{ar(\Delta\ AOD)}{ar(\Delta\ COD)}=\left(\frac{OA}{OC}\right)^2$$

$$=\left(\frac{6\text{ cm}}{8\text{ cm}}\right)^2$$

$$=\frac{9}{16}$$

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