Triangles Ex 4.6 Q16

Answer :

Given: The area of two similar $\Delta ABC = 20cm^2$, $\Delta DEF = 45cm^2$ respectively and AB = 5cm.

To find: measure of DE

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

$$\frac{ar(\Delta ABC)}{ar(\Delta DEF)} = \left(\frac{AB}{DE}\right)^2$$

$$\frac{20}{45} = \left(\frac{5}{DE}\right)^2$$

$$\frac{20}{45} = \frac{25}{DE^2}$$

$$DE^2 = \frac{25 \times 45}{20}$$

$$DE^2 = \frac{225}{4}$$

$$\boxed{DE = 7.5 \text{ cm}}$$

Triangles Ex 4.6 Q17

Answer :

Given: In ΔABC, PQ is a line segment intersecting AB at P, and AC at Q such that PQ || BC and PQ divides ΔABC in two parts equal in area.

To find: $\frac{BP}{AB}$

We have PQ || BC

And

$$Ar(\Delta APQ) = Ar(\text{quad } BPQC)$$

$$Ar(\Delta APQ) + Ar(\Delta APQ) = Ar(\text{quad } BPQC) + Ar(\Delta APQ)$$

$$2Ar(\Delta APQ) = Ar(\Delta ABC) \quad \ldots\ldots(1)$$

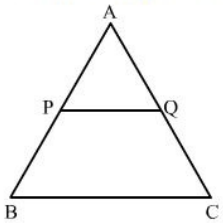
Now, PQ || BC and BA is a transversal.

In ΔAPQ and ΔABC,

$\angle APQ = \angle B$ (Corresponding angles)

$\angle PAQ = \angle BAC$ (Common)

So, $\Delta APQ \sim \Delta ABC$ (AA Similarity)



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

Hence

$$\frac{Ar(\Delta APQ)}{Ar(\Delta ABC)}=\frac{AP^2}{AB^2}$$

$$\frac{Ar(\Delta APQ)}{2Ar(\Delta APQ)}=\frac{AP^2}{AB^2}$$

$$\frac{1}{2}=\frac{AP^2}{AB^2}$$

$$\sqrt{\frac{1}{2}}=\frac{AP}{AB}$$

$$AB=\sqrt{2}AP$$

$$AB=\sqrt{2}(AB-BP)$$

$$\sqrt{2}BP=\sqrt{2}AB-AB$$

$$\sqrt{2}BP=(\sqrt{2}-1)AB$$

$$\boxed{\frac{BP}{AB}=\frac{(\sqrt{2}-1)}{\sqrt{2}}}$$

Triangles Ex 4.6 Q18

Answer :

Given: The areas of two similar triangles ABC and PQR are in the ratio 9 : 16. BC = 4.5cm.

To find: length of QR

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

$ar\Delta ABCar\Delta PQR=BCQR2$

$$\frac{9}{16}=\left(\frac{4.5}{QR}\right)^2$$

$$\frac{3}{4}=\frac{4.5}{QR}$$

$$QR=\frac{4\times 4.5}{3}$$

$$\boxed{QR=6\text{ cm}}$$

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