Triangles Ex 4.6 Q13

Answer :

GIVEN: In ΔABC, P divides the side AB such that AP : PB = 1 : 2, Q is a point on AC such that PQ || BC.

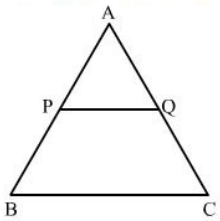
TO FIND: The ratio of the areas of ΔAPQ and the trapezium BPQC.

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.

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

$$\frac{Ar(\Delta APQ)}{Ar(\Delta ABC)} = \frac{1x^2}{(1x+2x)^2}$$

$$\frac{Ar(\Delta APQ)}{Ar(\Delta ABC)} = \frac{1}{9}$$

Let Area of ΔAPQ= 1 sq. units and Area of ΔABC = 9x sq. units

$$Ar[\text{trapBCED}] = Ar(\Delta ABC) - Ar(\Delta APQ)$$
$$= 9x - 1x$$
$$= 8x \text{ sq units}$$

Now,

$$\frac{\text{ar}(\Delta APQ)}{\text{ar}(\text{trapBCED})} = \frac{x \text{ sq units}}{8x \text{ sq units}} = \frac{1}{8}$$

Triangles Ex 4.6 Q14

Answer :

Given: The area of two similar triangles is 100cm^2 and 49cm^2 respectively. If the altitude of bigger triangle is 5 cm

To find: their corresponding altitude of other triangle

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

$$\frac{ar(\text{bigger triangle1})}{ar(\text{triangle2})} = \left(\frac{\text{altitudeof bigger triangle1}}{\text{altitude2}}\right)^2$$

$$\frac{100}{49} = \left(\frac{5}{\text{altitude2}}\right)^2$$

Taking square root on both side

$$\frac{10}{7} = \frac{5}{\text{altitude2}}$$

$$\boxed{\text{altitude2} = 3.5 \text{ cm}}$$

Triangles Ex 4.6 Q15

Answer :

Given: The area of two similar triangles is $121cm^2$ and $64cm^2$ respectively. IF the median of the first triangle is 12.1cm

To find: corresponding medians of the other triangle

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

$$\frac{ar(\text{triangle1})}{ar(\text{triangle2})} = \left(\frac{\text{median1}}{\text{median2}}\right)^2$$

$$\frac{121}{64} = \left(\frac{12.1}{\text{median2}}\right)^2$$

taking squareroot on bothside

$$\frac{11}{8} = \frac{12.1}{\text{median2}}$$

$$\boxed{\text{median 2} = 8.8\text{cm}}$$

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