

## Triangles Ex 4.6 Q9 Answer:

In the given figure, we have DE || BC.

In  $\triangle ADE$  and  $\triangle ABC$ 

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

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

So,  $\triangle ADE$ -  $\triangle ABC$  (AA Similarity)

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

Hence

$$\frac{Ar(\Delta ADE)}{Ar(\Delta ABC)} = \frac{DE^2}{BC^2}$$
$$\frac{16}{Ar(\Delta ABC)} = \frac{4^2}{6^2}$$
$$Ar(\Delta ABC) = \frac{6^2 \times 16}{4^2}$$

$$Ar(\Delta ABC) = 36 \text{ cm}^2$$

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

Hence.

$$\frac{Ar(\Delta ADE)}{Ar(\Delta ABC)} = \frac{DE^2}{BC^2}$$

$$\frac{25}{Ar(\Delta ABC)} = \frac{4^2}{8^2}$$

$$Ar(\Delta ABC) = \frac{8^2 \times 25}{4^2}$$

$$Ar(\Delta ABC) = 100 \text{ cm}^2$$

(iii) We know that

$$\frac{Ar(\Delta ADE)}{Ar(\Delta ABC)} = \frac{DE^2}{BC^2}$$

$$\frac{Ar(\Delta ADE)}{Ar(\Delta ABC)} = \frac{3^2}{5^2}$$

$$\frac{Ar(\Delta ADE)}{Ar(\Delta ABC)} = \frac{9}{25}$$

Let Area of  $\triangle ADE = 9x$  sq. units and Area of  $\triangle ABC = 25x$  sq. units

$$Ar[\text{trapBCED}] = Ar(\Delta ABC) - Ar(\Delta ADE)$$
  
=  $25x - 9x$   
=  $16x \text{ sq units}$ 

Now,

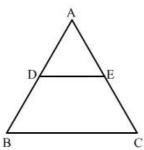
$$\frac{Ar(\Delta ADE)}{Ar(\text{trapBCED})} = \frac{9x}{16x}$$

$$\frac{Ar(\Delta ADE)}{Ar(trapBCED)} = \frac{9}{16}$$

Triangles Ex 4.6 Q10

## Answer:

Given: In  $\triangle$ ABC, D and E are the midpoints of AB and AC respectively. To find: Ratio of the areas of  $\triangle$ ADE and  $\triangle$ ABC.



Since it is given that D and E are the midpoints of AB and AC, respectively.

Therefore, DE || BC (Converse of mid-point theorem)

Also,  $DE = \frac{1}{2}BC$ 

In ΔADE and ΔABC

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

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

So,  $\triangle ADE - \triangle ABC$  (AA Similarity)

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

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

$$\frac{\operatorname{ar}(\Delta ADE)}{\operatorname{ar}(\Delta ABC)} = \left(\frac{1}{2}\right)^2$$

$$\frac{\operatorname{ar}(\Delta ADE)}{\operatorname{ar}(\Delta ABC)} = \left(\frac{1}{4}\right)$$

\*\*\*\*\*\*\*\*\* END \*\*\*\*\*\*\*