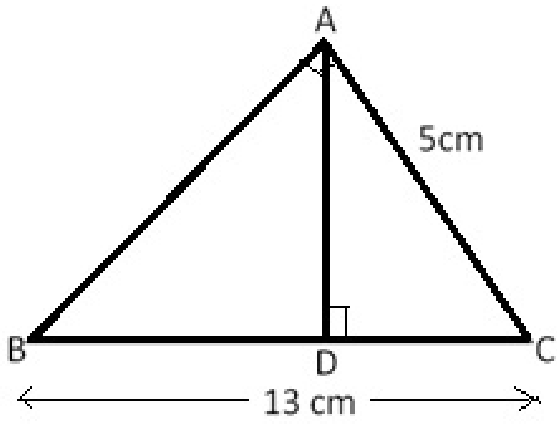
Exercise 4C

Question 11:



In ΔBAC and ΔADC, we have

$\angle BAC = \angle ADC = 90^0$ ($AD \perp BC$)

$\angle ACB = \angle DCA$ (common)

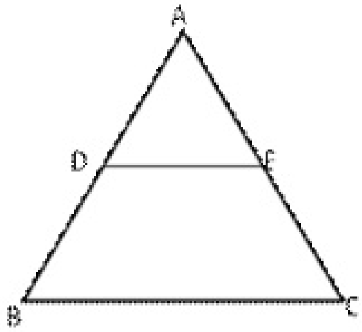
$\Delta BAC \sim \Delta ADC$

$$\therefore \frac{ar(\Delta ABC)}{ar(\Delta ADC)} = \frac{ar(\Delta BAC)}{ar(\Delta ADC)} = \frac{BC^2}{AC^2}$$

$$\Rightarrow \frac{ar(\Delta ABC)}{ar(\Delta ADC)} = \frac{13^2}{5^2} = \frac{169}{25}$$

Therefore, the ratio of the areas of ΔABC and ΔADC = 169:25

Question 12:



Let DE = 3x and BC = 5x

In ΔADE and ΔABC, we have

$\angle ADE = \angle ABC$ (corres. $\angle$s)

$\angle AED = \angle ACB$ (corres. $\angle$s)

$\Delta ADE \sim \Delta ABC$ (by AA similarity)

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

$$= \left(\frac{3x}{5x}\right)^2 = \frac{9x^2}{25x^2}$$

Let, ar(ΔADE) = $9x^2$ units

Then, ar(ΔABC) = $25x^2$ units

$$\therefore ar(\text{trap BCED}) = ar(\Delta ABC) - ar(\Delta ADE)$$

$$= (25x^2 - 9x^2)$$

$$= 16x^2 \text{ units}$$

$$\therefore \frac{ar(\Delta ADE)}{ar(\text{trap. BCED})} = \frac{9x^2}{16x^2} = \frac{9}{16}$$

Therefore, ratio of ar(ΔADE) to the ar(trap BCED) = 9:16

Question 13:

In ΔABC, D and E are midpoint of AB and AC respectively.

So, DE|| BC and $DE = \frac{1}{2}BC$

Now, in ΔADE and ΔABC, we have

$\angle ADE = \angle ABC$ (corres. $\angle$s)

$\angle AED = \angle ACB$ (corres. $\angle$s)

$\Delta ADE \sim \Delta ABC$ (by AA similarity)

Let AD = x and AB = 2x

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

$$\Rightarrow \frac{ar(\Delta ADE)}{ar(\Delta ABC)} = \frac{x^2}{(2x)^2} = \frac{1}{4}$$

Therefore, the ratio of the areas of ΔADE and ΔABC = 1:4

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