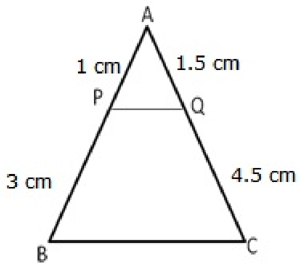
Exercise 4C

Question 9:



Given: AP = 1 cm, PB = 3 cm, AQ = 1.5 cm, QC = 4.5 cm
AB = AP + PB = (1 + 3) cm = 4 cm
AC = AQ + QC = (1.5 + 4.5) cm = 6 cm

Now, we have :

$$\frac{AP}{AB} = \frac{1}{4}, \frac{AQ}{QC} = \frac{1.5}{6} = \frac{1}{4}$$

In ΔAPQ and ΔABC, we have

$\angle APQ = \angle ABC$ (corresponding $\angle$s)

$\angle AQP = \angle ACB$ (corresponding $\angle$s)

$\Delta APQ \sim \Delta ABC$ [by AA similarity]

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

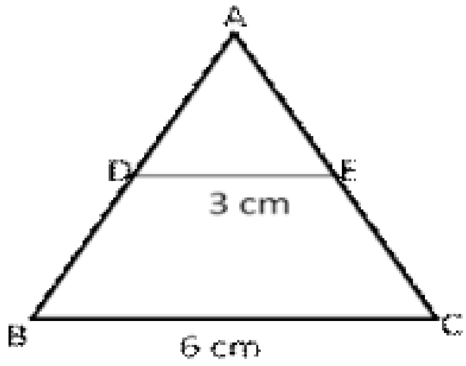
$$\Rightarrow \frac{ar(\Delta APQ)}{ar(\Delta ABC)} = \left(\frac{AP}{AB}\right)^2$$

$$\Rightarrow \frac{ar(\Delta APQ)}{ar(\Delta ABC)} = \left(\frac{1}{4}\right)^2 = \frac{1}{16}$$

$$\Rightarrow ar(\Delta APQ) = \frac{1}{16} ar(\Delta ABC)$$

Hence proved.

Question 10:



Given DE || BC

DE = 3 cm and BC = 6 cm

ar(ΔADE) = 15cm^2

In ΔADE and ΔABC, we have

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

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

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

$$\Rightarrow \frac{ar(\Delta ADE)}{ar(\Delta ABC)} = \frac{DE^2}{BC^2} \Rightarrow \frac{15}{ar(\Delta ABC)} = \frac{3^2}{6^2} = \frac{9}{36}$$

$$\Rightarrow ar(\Delta ABC) = \frac{15 \times 36}{9} = 60\ cm^2$$

$$\therefore\ ar(\Delta ABC) = 60\ cm^2$$

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