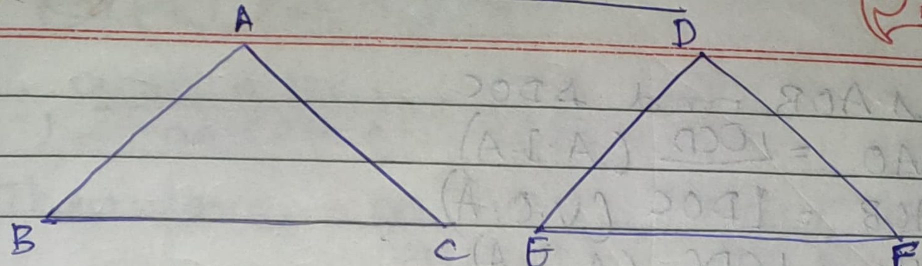
EXERCISE - 6.4

1.



Given that - $\Delta ABC \sim \Delta DEF$
The ar(ΔABC) and ΔDEF are $64\,cm^2$ and $121\,cm^2$ respectively.

$EF = 15.4\,cm$
To find $BC =$

$$\frac{64}{121} = \frac{x^2}{(15.4)^2}$$

$$\frac{64}{121} = \frac{x^2}{237.16}$$

$$64 \times 237.16 = x^2 \times 121$$

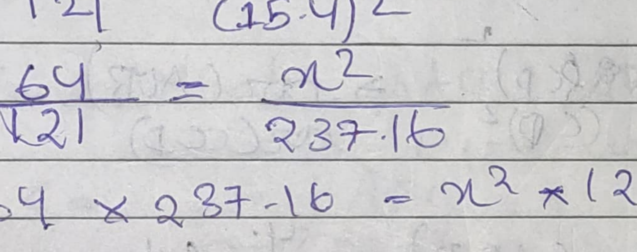
$$\frac{15178.24}{121} = x^2$$

$$x = \sqrt{125.44}$$

$$x = 11.2\,cm$$

So, $BC = 11.2\,cm$.

2.



Given - $AB \parallel DC$
$AB = 2(CD)$

To find - the ratios of $\frac{ar(\Delta AOB)}{ar(COD)}$

In ΔAOB and ΔDOC

$\angle BAO = \angle OCD$ (A.I.A)

$\angle AOB = \angle DOC$ (V.O.A)

$\angle ABO = \angle ODC$ (A.I.A)

So, by AAA similarity criterion

$\Delta AOB \sim \Delta DOC$

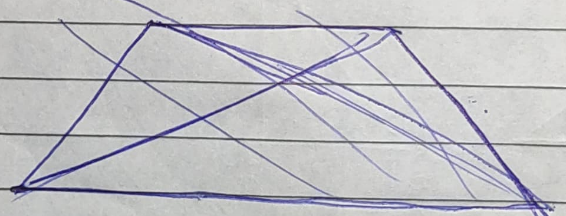
We know that, $AB = 2(CD)$

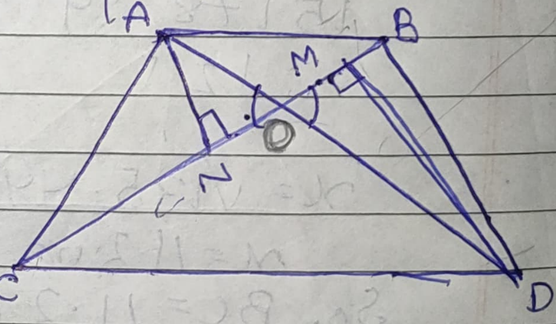
$\Rightarrow \frac{ar(AOB)}{ar(COD)} = \left(\frac{AB}{CD}\right)^2$

$\Rightarrow \frac{ar(AOB)}{ar(COD)} = \frac{(2CD)^2}{(CD)^2} \Rightarrow \frac{ar(AOB)}{ar(COD)} = \frac{4\,CD^2}{1\,(CD^2)}$

Hence, $\frac{ar(AOB)}{ar(COD)} = \frac{4}{1} = 4:1$

(3)





~~Given that~~ - AD intersects BC at O they meet at same base BC.

~~To show that~~ $\frac{ar(ABC)}{ar(DBC)} = \frac{AO}{DO}$

Draw two $\perp$'s AN and DM on line BC

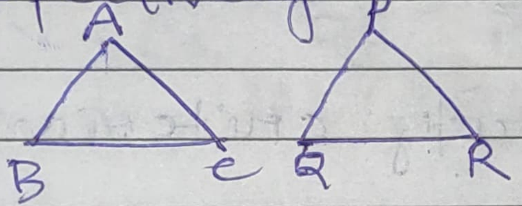
$ar(\Delta ABC) = 1/2 \times BC \times AN$, &

$ar(DMO) = 1/2 \times BC \times DM$

$\therefore \frac{ar(ABC)}{ar(CDM)} = \frac{AN}{DM}$

→ Therefore, $\frac{ar(ABC)}{ar(DBC)} = \frac{AO}{DO}$ (from eq. (1))

(4) Let the two Δ be ΔABC and ΔPQR respectively.



$$\frac{ar(ABC)}{ar(PQR)} = \left(\frac{AB}{PQ}\right)^2 = \left(\frac{BC}{QR}\right)^2 = \left(\frac{AC}{PR}\right)^2$$

Given that:- $\Delta ACB \sim \Delta PQR$

Here, $ar(ABC) = ar(PQR)$

So, $\frac{ar(ABC)}{ar(PQR)} = 1$

$$1 = \left(\frac{AB}{PQ}\right)^2 = \left(\frac{BC}{QR}\right)^2 = \left(\frac{AC}{PR}\right)^2$$

So, we get, $AB = PQ$

$BC = QR$

$AC = PR$

$\therefore \Delta ABC \cong \Delta PQR$

(By SSS congruence criterion)