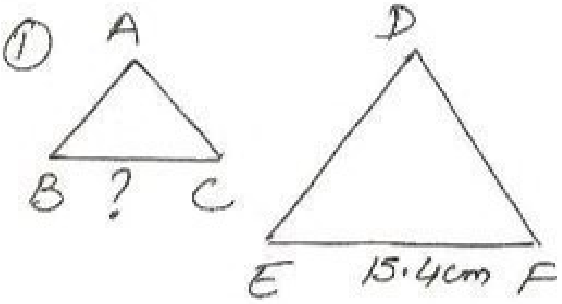
(1)



$\triangle ABC \sim \triangle DEF$

$\therefore \dfrac{ar(\triangle ABC)}{ar(\triangle DEF)} = \dfrac{BC^2}{EF^2}$

$\dfrac{64}{121} = \left(\dfrac{BC}{15.4}\right)^2$

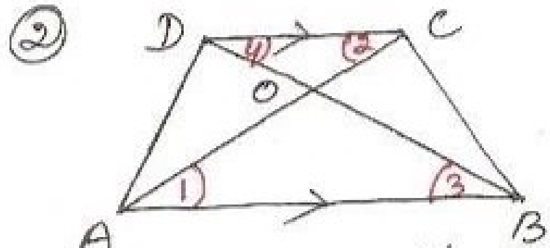
$\Rightarrow \left(\dfrac{8}{11}\right)^2 = \left(\dfrac{BC}{15.4}\right)^2$

$\Rightarrow \dfrac{BC}{15.4} = \dfrac{8}{11}$

$\Rightarrow BC = \dfrac{8}{\cancel{11}} \times \overset{1.4}{\cancel{15.4}}$

$= 11.2cm$

(2)



given - In fig $AB = 2CD$

to find $\dfrac{ar(\triangle AOB)}{ar(\triangle COD)}$

Solution $\triangle AOB \sim \triangle COD$ by AA prop

$\left[\begin{array}{l}\angle 1 = \angle 2 \\ \angle 3 = \angle 4\end{array}\right.$ alt int $\angle$s $AB \parallel DC$ $\Big]$

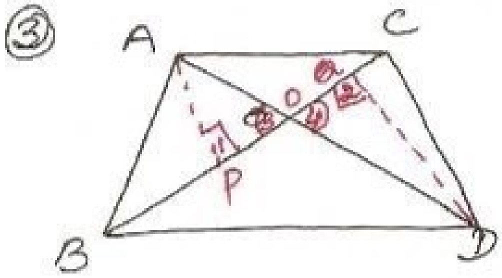
$\dfrac{ar(\triangle AOB)}{ar(\triangle COD)} = \dfrac{AB^2}{CD^2}$

$= \dfrac{(2CD)^2}{CD^2}$

$= \dfrac{4\cancel{CD^2}}{\cancel{CD^2}}$

$= \dfrac{4}{1}$

(3)



to show $\dfrac{ar(\triangle ABC)}{ar(\triangle DBC)} = \dfrac{AO}{DO}$

Const. $AP \perp BC$, $DQ \perp BC$

Proof $\triangle APO \sim \triangle DQO$ by AA cor.

$\left[\begin{array}{l}\angle 1 = \angle 2 = 90° \\ \angle 3 = \angle 4 \text{ ver opp } \angle s\end{array}\right]$

$\Rightarrow \dfrac{AP}{DQ} = \dfrac{AO}{DO} \quad \cdots (1)$

$\dfrac{ar(\triangle ABC)}{ar(DQO)} = \dfrac{\cancel{\tfrac{1}{2}} \times \cancel{BC} \times AP}{\cancel{\tfrac{1}{2}} \times \cancel{BC} \times DQ}$

$= \dfrac{AP}{DQ}$

$= \dfrac{AO}{DO}$ (using 1)