

First: the ratio of Areas of two similar triangles:

Theorem 3

Ratio of the areas of the surfaces of two similar triangles equals the square of the ratio of the lengths of any two corresponding sides of the two triangles *(Proof is not required)*

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$$\frac{a(\Delta ABC)}{a(\Delta DEF)} = \left(\frac{AB}{DE}\right)^2 = \left(\frac{BC}{EF}\right)^2 = \left(\frac{CA}{FD}\right)^2$$

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$$\therefore \angle A \cong \angle X \text{ \& } \angle B \cong \angle Y$$

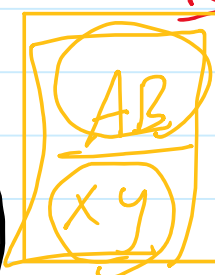
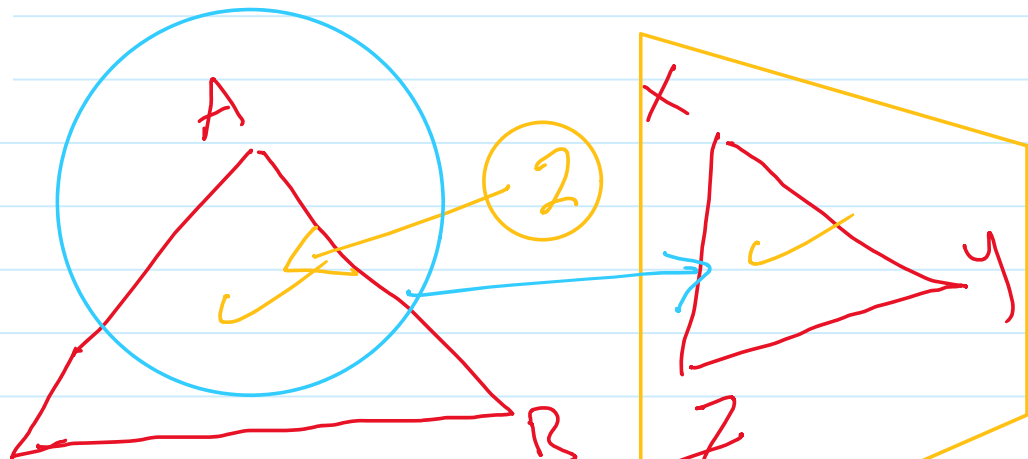
$$\angle C \cong \angle Z$$

$$\therefore \Delta ABC \sim \Delta XYZ$$

$$\frac{AB}{xy} = \frac{BC}{yz} = \frac{CA}{zx} = \frac{P. \Delta ABC}{P. \Delta XYZ}$$

$$\left(\frac{AB}{xy}\right)^2 = \left(\frac{BC}{yz}\right)^2 = \left(\frac{CA}{zx}\right)^2 = \frac{A. \Delta ABC}{A. \Delta XYZ}$$

$$XYZ \sim ABC \quad \frac{xy}{AB} = \frac{yz}{BC}$$



$\frac{4}{2} = 2$ SAS
SSS
= 2 enlarge.

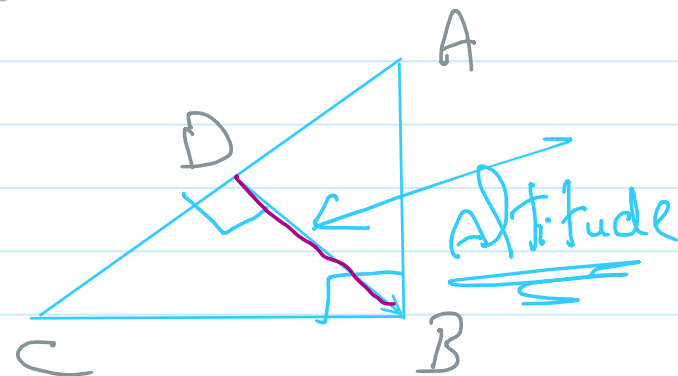
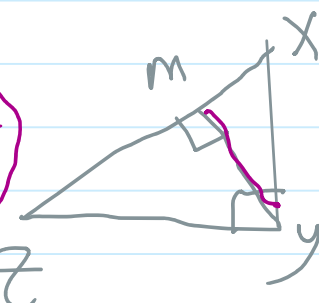
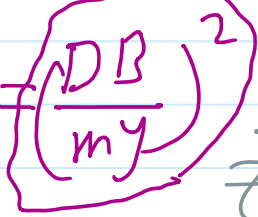
$$\frac{xy}{AB} = \frac{2}{4} = \frac{1}{2}$$

i.e. the ratio of the areas of the surfaces of two similar triangles equals the square of the ratio the lengths of any two corresponding altitudes of the two triangles.

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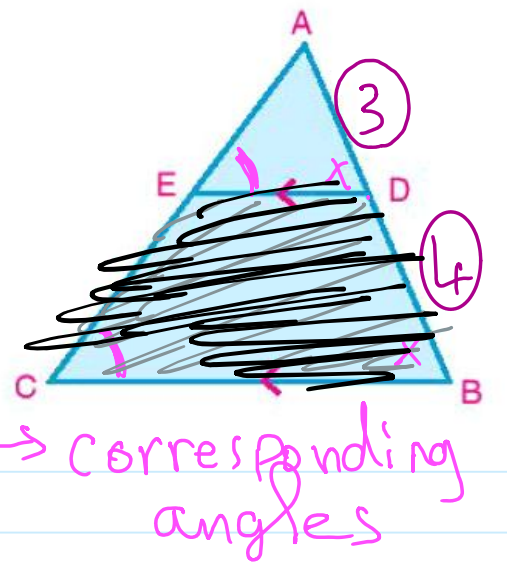
$$\Delta ABC \sim \Delta XYZ$$

$$\left(\frac{AB}{xy}\right)^2 = \left(\frac{BC}{yz}\right)^2 = \left(\frac{CA}{zx}\right)^2 = \left(\frac{DB}{my}\right)^2$$



1 In the figure opposite: ABC is a triangle D ∈ AB where $\frac{AD}{DB} = \frac{3}{4}$, DE // BC and intersects AC at E. if the area of Δ ABC = 784cm². find:

- A area of Δ ADE
- B area of trapezium DBCE.



$\therefore DE \parallel BC$

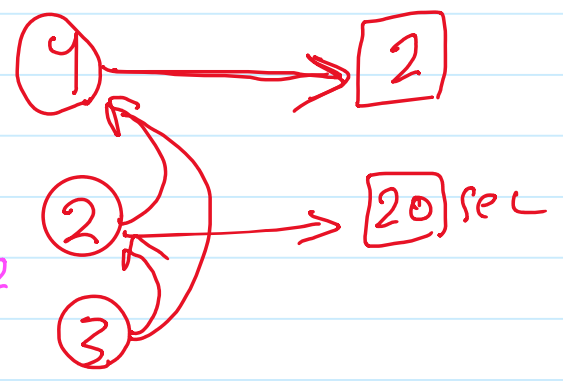
$\therefore m(\angle ADE) = m(\angle ABC)$
 $\therefore m(\angle AED) = m(\angle ACB)$

$\therefore \Delta ABC \sim \Delta ADE$ (AA pos. t)

$\left(\frac{AB}{AD}\right)^2 = \left(\frac{BC}{DE}\right)^2 = \left(\frac{CA}{EA}\right)^2 = \frac{A. \Delta ABC}{A. \Delta AED}$

$\frac{7^2}{3^2} = \frac{BC^2}{DE^2} = \frac{CA^2}{EA^2} = \frac{784}{A. \Delta AED}$

99%



$A. \Delta AED = \frac{784 \times 9}{49} = \dots \text{cm}^2$

2 The ratio of the areas of two similar triangles equals 4 : 9. If the perimeter of the greater triangle equals 90cm, Find the perimeter of the smaller triangle.

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Let

Let $\Delta ABC \sim XYZ$

$\frac{AB^2}{XY^2} = \frac{A. \Delta ABC}{A. \Delta XYZ} = \frac{4}{9}$

$\frac{AB}{XY} = \frac{2}{3} = \frac{P. \Delta ABC}{P. \Delta XYZ}$

$\frac{2}{3} = \frac{P}{90}$

$P = \frac{90 \times 2}{3} = 60 \text{ cm}$