8-1 Similarity in Right Triangles

std. 5.0

Fr Jan 30

x is the *geometric mean* between a and b if $\frac{a}{x} = \frac{x}{b}$ and $a, b, x > 0$.

ex 1 Find the geometric mean between 28 and 12.

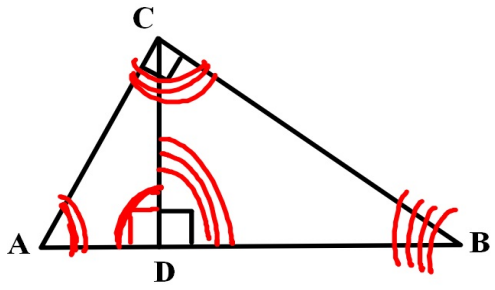
$$\frac{28}{x} = \frac{x}{12}$$

$$\sqrt{x^2} = \sqrt{28 \cdot 12}$$

$$\sqrt{4}\sqrt{7} \quad \sqrt{4}\sqrt{3}$$

$$x = 2\sqrt{7} \cdot 2\sqrt{3} = 4\sqrt{21}$$

Thm. The altitude drawn to the hypotenuse of a right triangle forms 2 triangles similar to the original triangle and to each other.



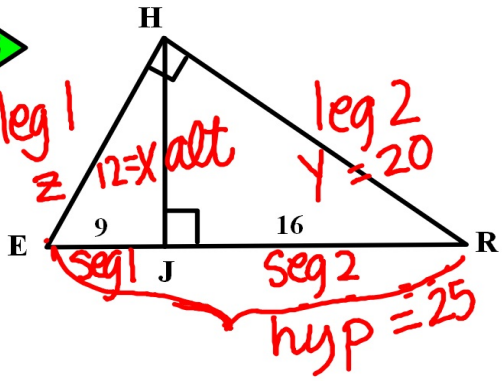
$\Delta ABC \sim \Delta ACD$

$\Delta ABC \sim \Delta CBD$

By transitive

$\Delta ACD \sim \Delta CBD$

ex 2



HJ = 12
RE = 25
RH = 20
HE = 15

$\frac{25}{z} = \frac{z}{9}$

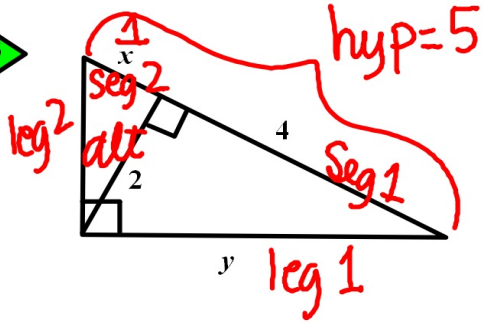
$\frac{9}{x} = \frac{x}{16}$ $\quad \sqrt{x^2} = \sqrt{144}$

$\frac{25}{y} = \frac{y}{16}$ $\quad \sqrt{y^2} = \sqrt{25 \cdot 16}$

$y = 5 \cdot 4$

$y = 20$

ex 3



$\frac{4}{2} = \frac{2}{x}$

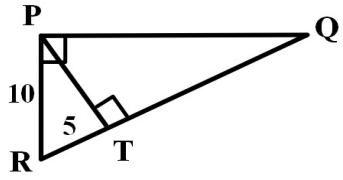
$x = 1$

$\frac{5}{y} = \frac{y}{4}$

$\sqrt{y^2} = \sqrt{20}$

$y = 2\sqrt{5}$

ex 4



TQ =