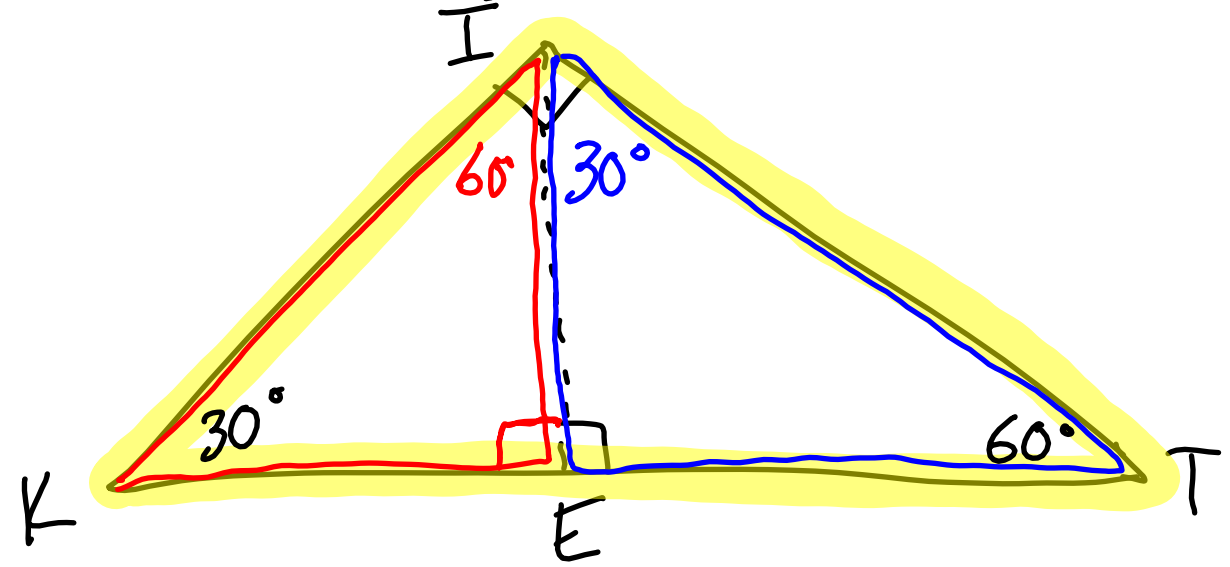


Similarity in Right Triangles

- Altitudes in Right Δ 's Theorem \rightarrow Altitude creates 3 similar Δ 's



$$\Delta KIT \sim \Delta KIE \sim \Delta IET$$

Similarity
Statement

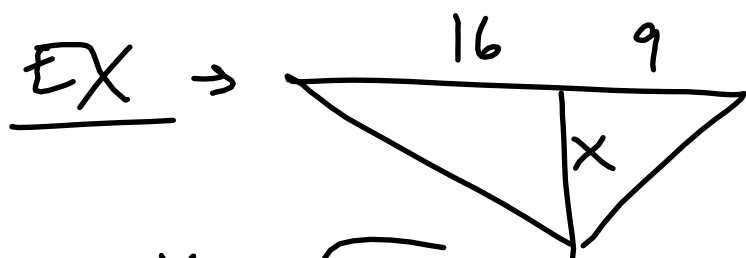
- Corollary 1 (Altitude Rule) \rightarrow altitude is geometric mean of 2 segments of the hypotenuse

\hookrightarrow geometric mean \rightarrow square root of the product of 2 #'s

EX $\rightarrow 25, 4 \Rightarrow \sqrt{25 \cdot 4} = \sqrt{100} = 10$

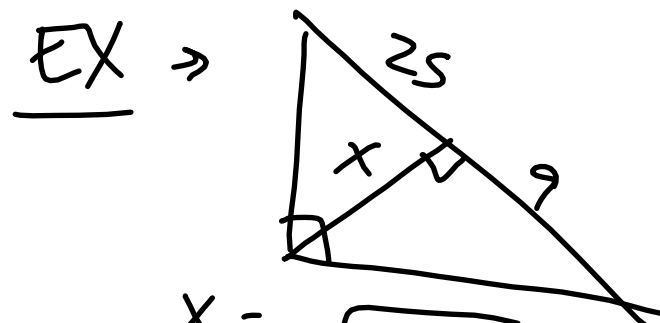
EX $\rightarrow 4, 16 \Rightarrow \sqrt{4 \cdot 16} = \sqrt{64} = 8$

EX $\rightarrow 3, 9 \Rightarrow \sqrt{27} = \sqrt{9 \cdot 3} = 3\sqrt{3}$



$$x = \sqrt{9 \cdot 16}$$

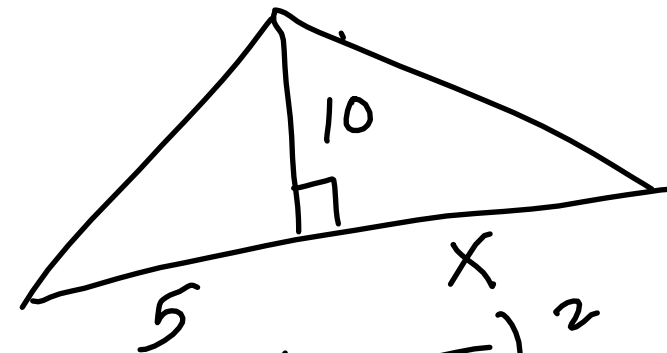
$$x = \sqrt{144} = 12$$



$$x = \sqrt{25 \cdot 9}$$

$$x = \sqrt{225} = 15$$

EX \rightarrow

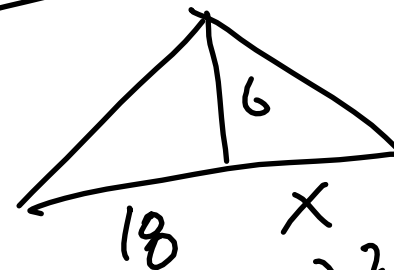


$$(10)^2 = (\sqrt{5 \cdot x})^2$$

$$100 = 5x$$

$$x = 20$$

EX \rightarrow

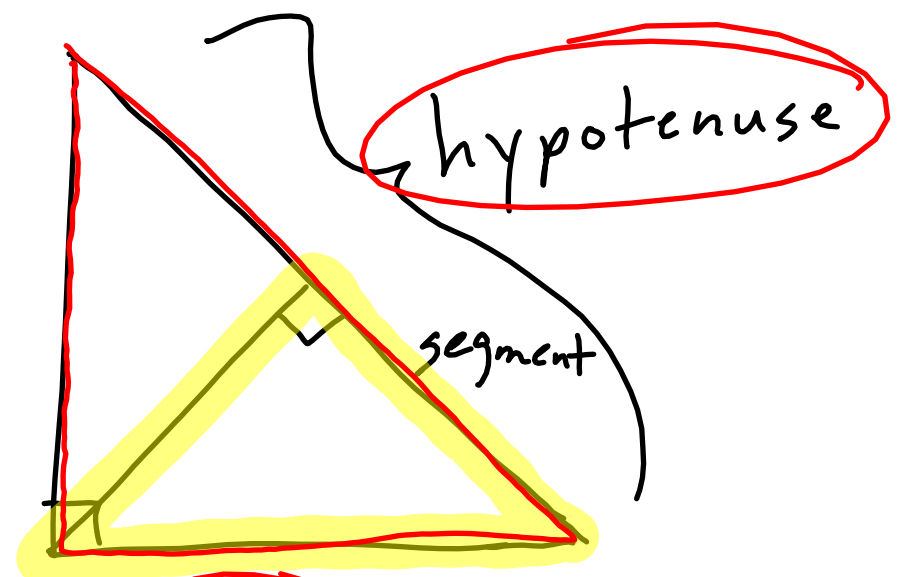


$$(6)^2 = (\sqrt{18x})^2$$

$$\frac{36}{18} = \frac{18x}{18}$$

$$x = 2$$

- Corollary 2 (Legs Rule) \rightarrow ratio of leg to adjacent segment of hypotenuse is equal to ratio of leg to hypotenuse



$$\frac{\text{leg big } \Delta}{\text{hypotenuse big } \Delta} = \frac{\text{leg small } \Delta}{\text{hypotenuse small } \Delta}$$

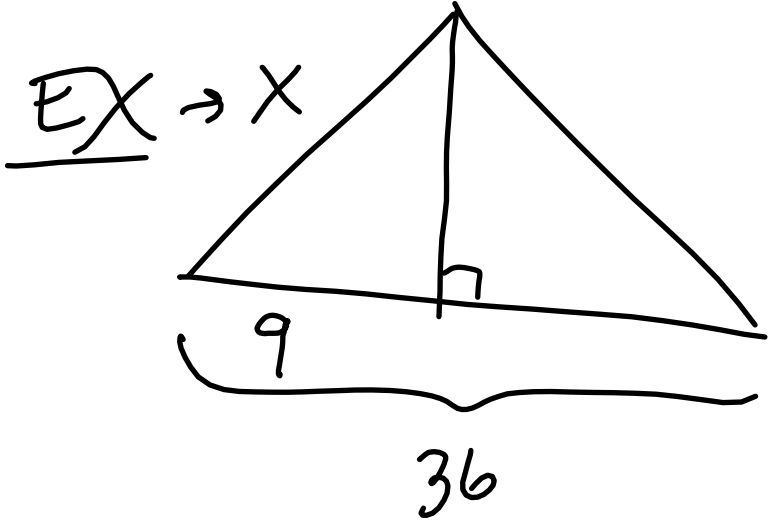
segment
leg

EX \rightarrow

$\frac{L}{H} = \frac{20}{25} = \frac{x}{20}$

$25x = 400$

$x = 16$

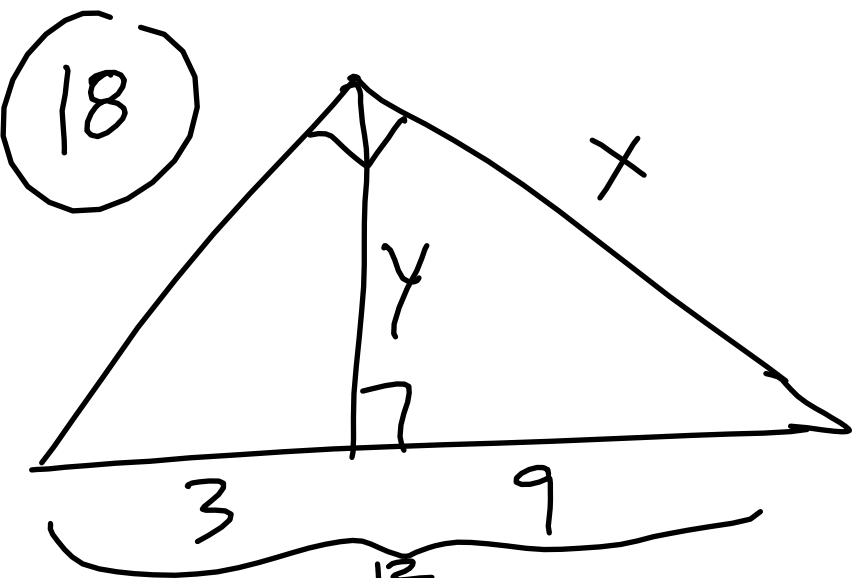


$$\frac{L}{H} = \frac{x}{36} = \frac{9}{x}$$

$$\sqrt{x^2} = \sqrt{324}$$

$x = 18$

HW: p. 465 → 12-21, 24-28, 48



$$y = \sqrt{3 \cdot 9} = \sqrt{27} = \sqrt{9 \cdot 3}$$

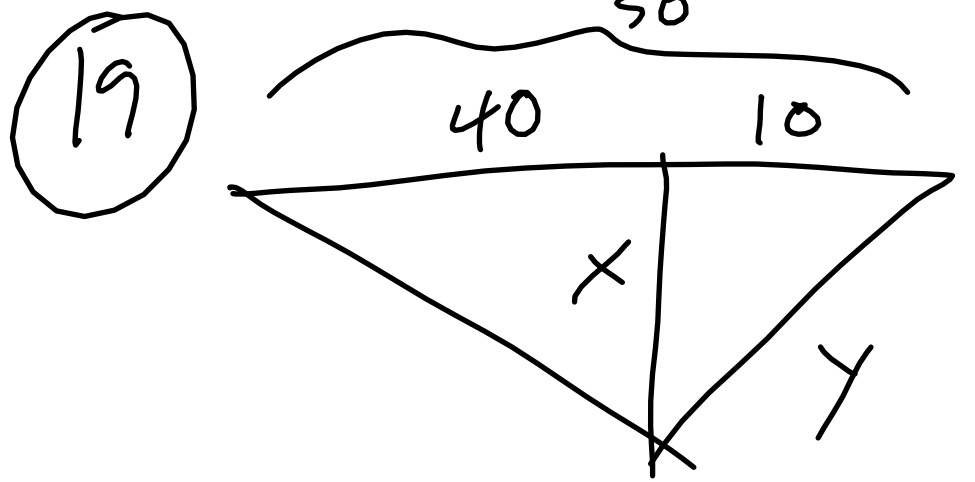
$$= 3\sqrt{3}$$

$$\frac{\text{Leg}}{\text{Hyp}} = \frac{9}{x} = \frac{x}{12}$$

$$\sqrt{x^2} = \sqrt{108}$$

$$x = \sqrt{36 \cdot 3}$$

$$x = 6\sqrt{3}$$



$$x = \sqrt{40 \cdot 10} = \sqrt{400}$$

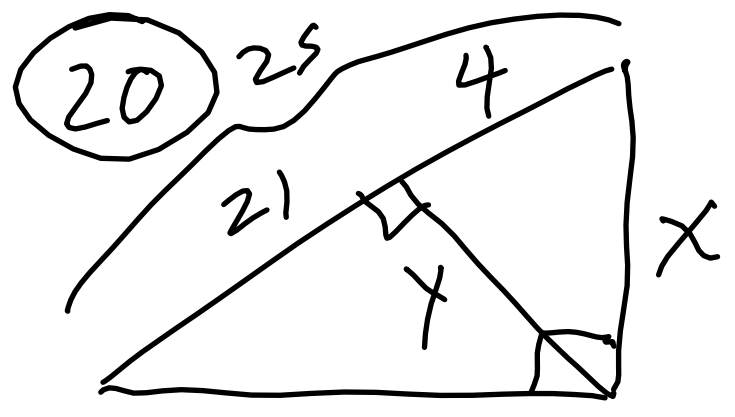
$$x = 20$$

$$\frac{10}{y} = \frac{y}{50}$$

$$y^2 = 500$$

$$y = \sqrt{500} = \sqrt{100 \cdot 5}$$

$$= 10\sqrt{5}$$



$$y = \sqrt{4 \cdot 21}$$

$$28$$

$$y = 2\sqrt{21}$$

$$48$$

$$\frac{4}{x} = \frac{x}{25}$$

$$\sqrt{x^2} = \sqrt{100}$$

$$x = 10$$

$$\begin{aligned} \textcircled{28} \quad & \sqrt{28} \cdot \sqrt{7} \\ & = \sqrt{196} \\ & = 14 \end{aligned}$$

$$\textcircled{GM = \sqrt{14}}$$

$$\begin{aligned} \textcircled{48} \quad & 5 \cdot 15 \\ & = 75 \end{aligned}$$

$$\text{Alt} = \sqrt{75}$$

$$= \sqrt{25} \cdot \sqrt{3}$$

$$\textcircled{= 5\sqrt{3}}$$

B