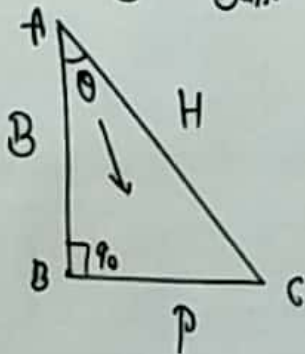
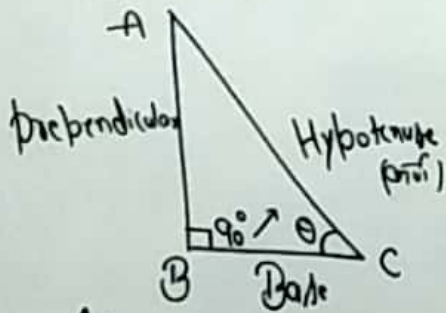
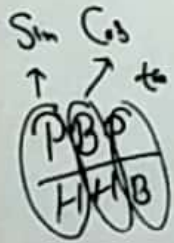


# Trigonometry - T-Ratios

Right angle  $\Delta \rightarrow$



$$\sin \theta = \frac{P}{H}$$

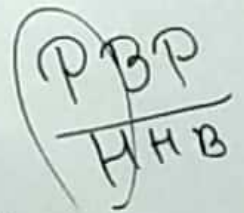
$$\cos \theta = \frac{B}{H}$$

$$\tan \theta = \frac{P}{B}$$

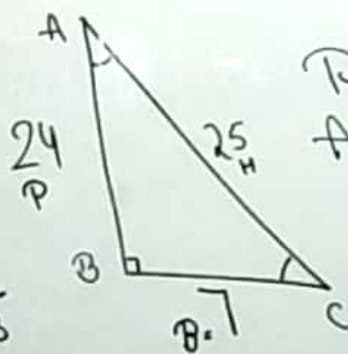
$$\operatorname{Cosec} \theta = \frac{1}{\sin \theta} = \frac{H}{P}$$

$$\sec \theta = \frac{1}{\cos \theta} = \frac{H}{B}$$

$$\cot \theta = \frac{1}{\tan \theta} = \frac{B}{P}$$



①



$\underline{24 \rightarrow 7 \rightarrow 25}$

$\frac{PBP}{HAB}$

P.T

$$\begin{aligned} AC^2 &= AB^2 + BC^2 \\ &= 24^2 + 7^2 \\ &= 576 + 49 \\ &= 625 \end{aligned}$$

$$AC^2 = 25^2$$

$$AC = 25$$

$$(i) \sin A = \frac{P}{H} = \frac{7}{25}$$

$$\cos A = \frac{B}{H} = \frac{24}{25}$$

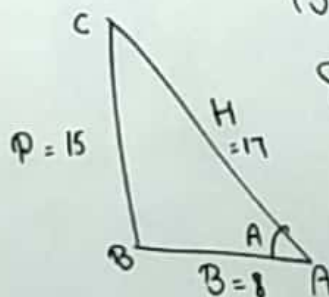
$$(ii) \sin C = \frac{P}{H} = \frac{24}{25}$$

$$\cos C = \frac{B}{H} = \frac{7}{25}$$

④

$$15 \cot A = 8$$

$$\cot A = \frac{8}{15} = \frac{B}{P}$$



$$\sin A = \frac{P}{H} = \frac{15}{17}$$

$$\sec A = \frac{H}{B} = \frac{17}{8}$$

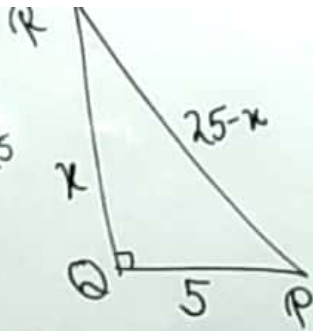
$$\begin{aligned} AC^2 &= 15^2 + 8^2 \\ &= 225 + 64 = 289 \end{aligned}$$

$$AC^2 = 17^2$$

$$AC = 17$$

(10)

$PR + QR = 25$   
by P.T

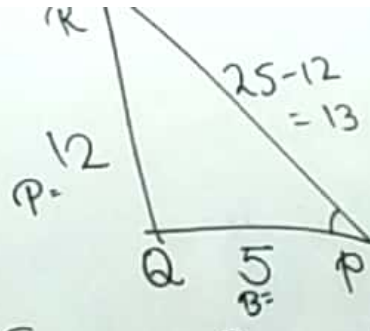


$$(25-x)^2 = 5^2 + x^2$$

$$625 + x^2 - 50x = 25 + x^2$$

$$12x = 50x$$

$$\boxed{x = 12}$$

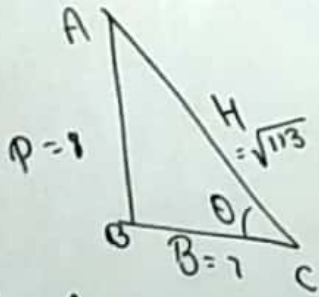


$$\sin P = \frac{P}{H} = \frac{12}{13}$$

$$\cos P = \frac{B}{H} = \frac{5}{13}$$

$$\tan P = \frac{P}{B} = \frac{12}{5}$$

$$\cot \theta = \frac{7}{8} = \frac{B}{P}$$



$$\begin{aligned} AC^2 &= AB^2 + BC^2 \\ &= 8^2 + 7^2 \\ &= 64 + 49 \end{aligned}$$

$$AC^2 = 113$$

$$AC = \sqrt{113}$$

$$\sin \theta = \frac{P}{H} = \frac{8}{\sqrt{113}}$$

$$\cos \theta = \frac{B}{H} = \frac{7}{\sqrt{113}}$$

$$(ii) \cot^2 \theta$$

$$= \left(\frac{7}{8}\right)^2$$

$$= \frac{49}{64}$$

$$(i) \frac{(1 + \sin \theta)(1 - \sin \theta)}{(1 + \cos \theta)(1 - \cos \theta)}$$

$$= \frac{1^2 - \sin^2 \theta}{1^2 - \cos^2 \theta}$$

$$= \frac{1 - \left(\frac{8}{\sqrt{113}}\right)^2}{1 - \left(\frac{7}{\sqrt{113}}\right)^2}$$

$$\begin{aligned} &= \frac{1 - \frac{64}{113}}{1 - \frac{49}{113}} = \frac{\frac{113-64}{113}}{\frac{113-49}{113}} \\ &= \frac{49}{64} \end{aligned}$$