an angle

Sine of θ	$\sin\theta =$
Cosine	$\cos\theta$
tangent	$\tan\theta$
cotangent	$\cot\theta$
secant	$\sec\theta$
cosecant	$\csc\theta$
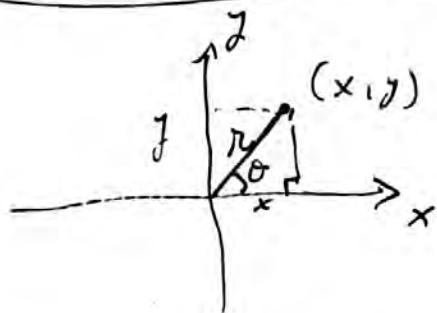
$$\text{angle of } A = \angle A = \hat{A} = A$$

$$r^2 = x^2 + y^2$$

$$c^2 = a^2 + b^2$$

$$\sin\theta = \frac{opp}{hyp} = \frac{y}{r} \quad \left\{ -1 \leq \leq 1 \right\} \quad \text{or} \quad \sin A = \frac{a}{c} \quad \leq 1$$

$$\cos\theta = \frac{adj}{hyp} = \frac{x}{r} \qquad \cos A = \frac{b}{c}$$

$$\tan\theta = \frac{opp}{adj} = \frac{\sin\theta}{\cos\theta} = \frac{y}{x} \qquad \tan A = \frac{a}{b}$$

$$\csc\theta = \frac{1}{\sin\theta} = \frac{r}{y} \qquad \csc A = \frac{c}{a}$$

$$\sec\theta = \frac{1}{\cos\theta} = \frac{r}{x} \qquad \sec A = \frac{c}{b}$$

$$\cot\theta = \frac{1}{\tan\theta} = \frac{x}{r} \qquad \cot A = \frac{b}{a}$$

Ex Find 6 trig θ : $(8, 15) \rightarrow 17$

$$\sin\theta = \frac{15}{17} \qquad \cos\theta = \frac{8}{17} \qquad \tan\theta = \frac{15}{8}$$

$$\csc\theta = \frac{17}{15} \qquad \sec\theta = \frac{17}{8} \qquad \cot\theta = \frac{8}{15}$$

 # 6 $(9, -12) \xrightarrow{3} (3, -4) \rightarrow 5$

$$\sin\theta = -\frac{4}{5} \qquad \cos\theta = \frac{3}{5} \qquad \tan\theta = -\frac{4}{3}$$

$$\csc\theta = -\frac{5}{4} \qquad \sec\theta = \frac{5}{3} \qquad \cot\theta = -\frac{3}{4}$$
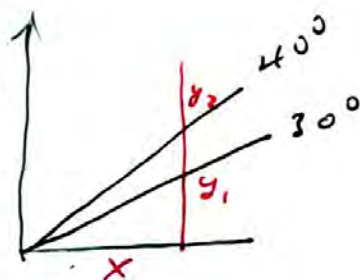

$\tan 30°$? $\tan 40°$

$$\tan 30° = \frac{y_1}{x}$$

$$\tan 40° = \frac{y_2}{x}$$

$$y_2 > y_1$$

$$\frac{y_2}{x} > \frac{y_1}{x}$$

$$\tan 40° > \tan 30°$$

5x

$$\cos\theta = \frac{\sqrt{3}}{2} \qquad \theta \in Q\,\overline{IV}$$

$$\sin\theta = \frac{-1}{2} \qquad\qquad \cos\theta = \frac{\sqrt{3}}{2} \qquad \tan\theta = -\frac{1}{\sqrt{3}}$$

$$\csc\theta = -2 \qquad\qquad \sec\theta = \frac{2}{\sqrt{3}} \qquad \cot\theta = -\sqrt{3}$$

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$$\cos\theta = -\frac{12}{13} \qquad \theta \in Q\,\overline{III} \qquad\qquad (+)$$

$$\sin\theta = -\frac{5}{13} \qquad \cos\theta = -\frac{12}{13} \qquad \tan\theta = \frac{5}{12}$$

$$\csc\theta = -\frac{13}{5} \qquad \sec\theta = -\frac{13}{12} \qquad \cot\theta = \frac{12}{5}$$

$$\frac{x^2}{r^2} + \frac{y^2}{r^2} = \frac{r^2}{r^2}$$

$$\left(\frac{x}{r}\right)^2 + \left(\frac{y}{r}\right)^2 = 1$$

$$\boxed{\cos^2\theta + \sin^2\theta = 1}$$

$$\frac{\cos^2\theta}{\cos^2\theta} + \frac{\sin^2\theta}{\cos^2\theta} = \frac{1}{\cos^2\theta} \qquad \left(\frac{1}{\cos\theta}\right)^2$$

$$\boxed{1 + \tan^2\theta = \sec^2\theta}$$

$$\frac{\cos^2\theta}{\sin^2\theta} + \frac{\sin^2\theta}{\sin^2\theta} = \frac{1}{\sin^2\theta}$$
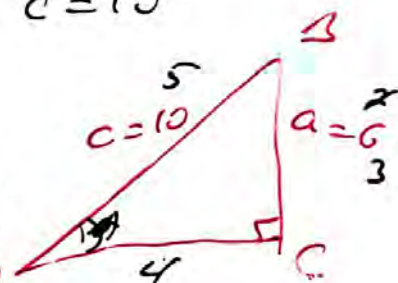
$$\cot^2\theta + 1 = \csc^2\theta$$

or $\sqrt{x^2+9}$ $3\tan\theta$ for $x = 3\tan\theta$

$$\sqrt{x^2+9} = \sqrt{9\tan^2\theta + 9}$$
$$= \sqrt{9(\tan^2\theta + 1)}$$
$$= 3\sqrt{\sec^2\theta}$$
$$= 3\sec\theta$$

ABC, $C = 90^\circ$ $a = 6$ $c = 10$

$$b = 2(4)$$

$\sin A = \frac{3}{5}$ $\cos A = \frac{4}{5}$ $\tan\theta = \frac{3}{4}$

$\csc A = \frac{5}{3}$ $\sec A = \frac{5}{4}$ $\cot A = \frac{4}{3}$

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if $A + B = 90^\circ \Rightarrow$

$$\sin A = \cos B = \cos(90^\circ - A)$$
$$\cos A = \sin B$$