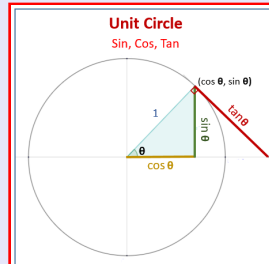


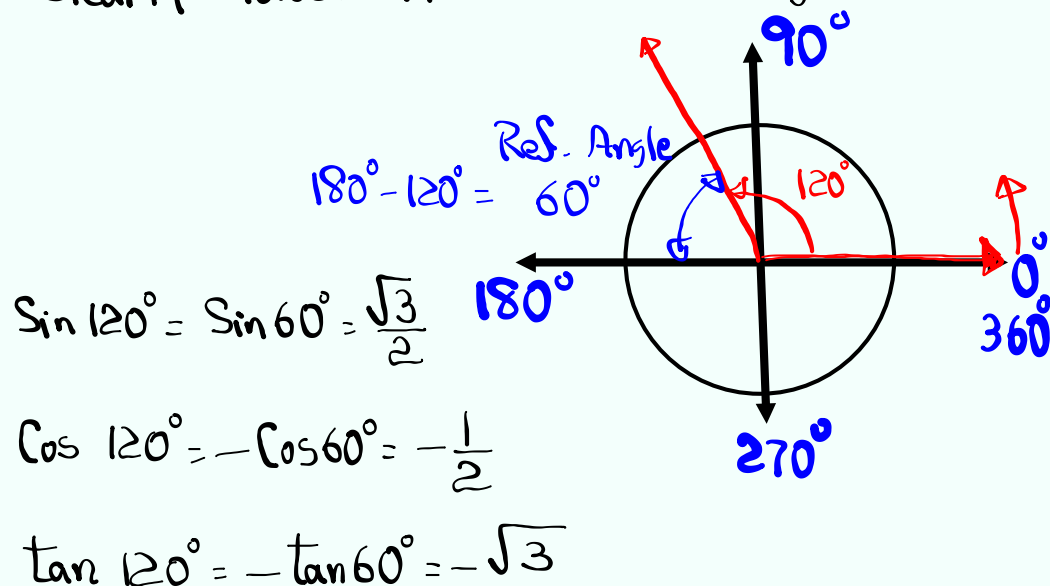
Trigonometry

Lecture 10



Feb 19-8:47 AM

Draw 120° in standard position,
clearly label its reference angle.



Sep 11-10:26 AM

Draw $\frac{7\pi}{6}$ in standard position,

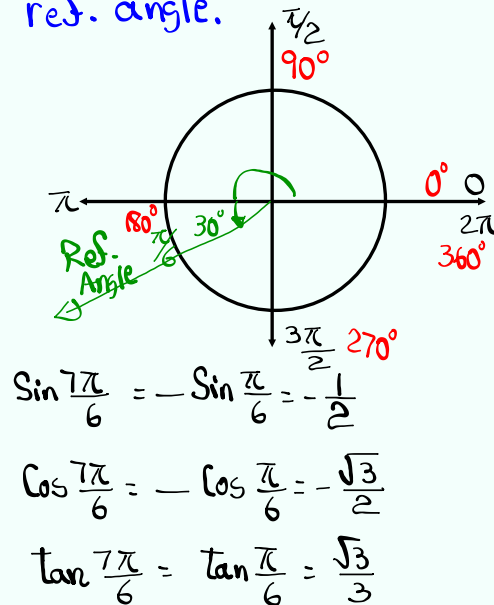
clearly label its ref. angle.

$$\pi = 180^\circ$$

$$\frac{\pi}{6} = 30^\circ$$

$$\frac{7\pi}{6} = 210^\circ$$

$$\begin{aligned}\frac{7\pi}{6} &= \frac{6\pi}{6} + \frac{\pi}{6} \\ &= \pi + \frac{\pi}{6}\end{aligned}$$



Sep 11-10:31 AM

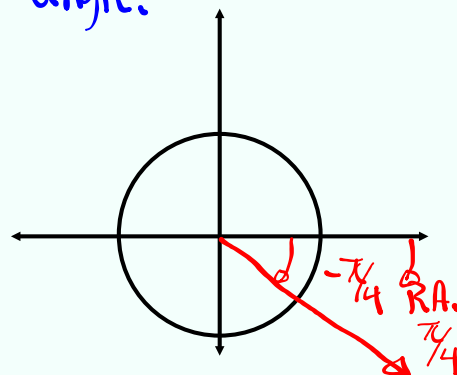
Draw $-\frac{\pi}{4}$ in standard position,

clearly label its ref. angle.

$$\sin -\frac{\pi}{4} = -\sin \frac{\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$\cos -\frac{\pi}{4} = \cos \frac{\pi}{4} = \frac{\sqrt{2}}{2}$$

$$\tan -\frac{\pi}{4} = -\tan \frac{\pi}{4} = \boxed{-1}$$

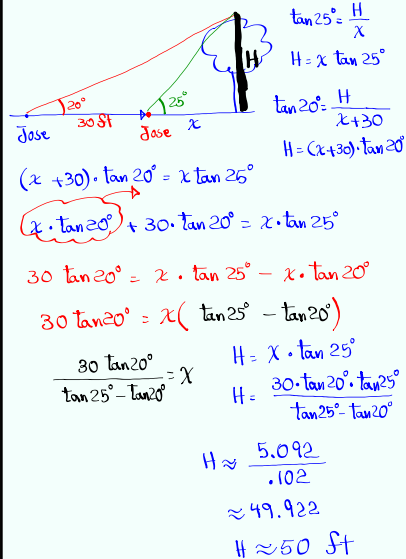


Sep 11-10:37 AM

Jose is looking at the top of a tree with angle of elevation of 20° .

He walks 30 ft towards the tree and now the angle of elevation is 25° .

How tall is the tree? Drawing is required.



Sep 11-10:41 AM

Verify $\frac{\cot A}{\csc A} = \cos A$

$$\frac{\cot A}{\csc A} = \frac{\frac{\cos A}{\sin A}}{\frac{1}{\sin A}} = \frac{\cos A}{\sin A} \cdot \frac{1}{\sin A}$$

$$= \frac{\cos A \cdot \cancel{\sin A}}{\cancel{\sin A} \cdot 1} = \frac{\cos A}{1} = \cos A \checkmark$$

Verify $\tan A \cdot \csc A \cdot \cos A = 1 \checkmark$

$$\frac{\cancel{\sin A}}{\cos A} \cdot \frac{1}{\cancel{\sin A}} \cdot \cos A =$$

$$\frac{\cos A}{\cos A} = 1$$

Sep 11-10:55 AM

Verify $(1 - \cos x) \cdot (1 + \cos x) = \sin^2 x$

$$(A - B)(A + B)$$

$$A^2 - B^2$$

$$1^2 - \cos^2 x =$$

$$\sin^2 x + \cancel{\cos^2 x} - \cancel{\cos^2 x} = \sin^2 x$$

$$(1 - \cos x)(1 + \cos x)$$

$$= 1 + \cancel{\cos x} - \cancel{\cos x} - \cos^2 x$$

$$= 1 - \cos^2 x = \sin^2 x$$

Sep 11-11:03 AM

Verify $\sec^2 x - \tan^2 x = 1$ ✓

$$1 + \tan^2 A = \sec^2 A$$

$$1 + \cancel{\tan^2 x} - \cancel{\tan^2 x} = 1 \checkmark$$

Verify $\frac{\cos x}{1 + \sin x} + \frac{1 + \sin x}{\cos x} = 2 \sec x$ ✓

$$\frac{\cos x \cdot \cos x}{(1 + \sin x) \cos x} + \frac{(1 + \sin x)(1 + \sin x)}{\cos x (1 + \sin x)}$$

$$= \frac{\cos^2 x + 1 + \sin x + \sin x + \sin^2 x}{(1 + \sin x) \cos x}$$

$$= \frac{1 + 1 + 2\sin x}{(1 + \sin x) \cos x} = \frac{2 + 2\sin x}{(1 + \sin x) \cdot \cos x}$$

$$= \frac{2(1 + \sin x)}{(1 + \sin x) \cdot \cos x}$$

$$= \frac{2}{\cos x} = 2 \cdot \frac{1}{\cos x}$$

$$= 2 \sec x$$

Sep 11-11:07 AM

Verify $\frac{1 + \sin x}{\cos x + \cot x} = \tan x$

$$\frac{1 + \sin x}{\cos x + \cot x} = \frac{1 + \sin x}{\cos x + \frac{\cos x}{\sin x}}$$

Multiply by $\sin x$

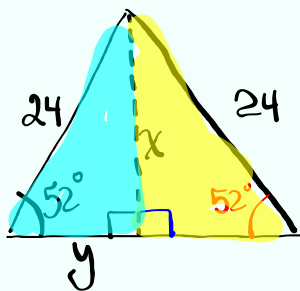
$$= \frac{\sin x (1 + \sin x)}{\sin x \cos x + \cancel{\sin x} \cdot \frac{\cos x}{\cancel{\sin x}}}$$

$$= \frac{\sin x (1 + \sin x)}{\sin x \cos x + \cos x}$$

$$= \frac{\sin x (\cancel{1 + \sin x})}{\cos x (\cancel{\sin x + 1})} = \frac{\sin x}{\cos x} = \tan x$$

Sep 11-11:19 AM

Find x & y :



$$\cos 52^\circ = \frac{y}{24}$$

$$\sin 52^\circ = \frac{x}{24}$$

$$x = 24 \cdot \sin 52^\circ$$

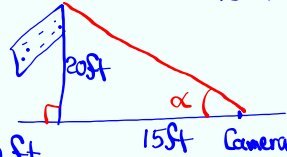
$$x \approx 18.912 \quad \boxed{x \approx 19}$$

$$y = 24 \cdot \cos 52^\circ$$

$$y \approx 14.776 \quad \boxed{y \approx 15}$$

Sep 11-11:25 AM

A camera is on the ground and is 15ft from a flag.



Height of the flag is 20ft.

what is the angle of elevation from the camera to the top of the flag?

Drawing required.

$$\tan \alpha = \frac{20}{15}$$

$$\tan \alpha = \frac{4}{3}$$

tan.
inverse

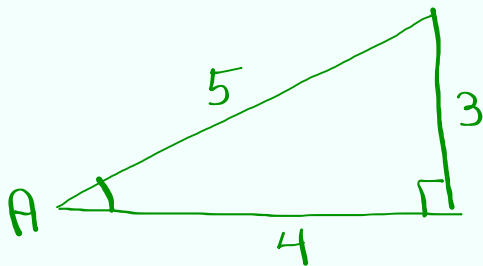
inverse process

$$\alpha = \tan^{-1}\left(\frac{4}{3}\right)$$

$$\alpha \approx 53^\circ$$

Sep 11-11:31 AM

Find A



$$\sin A = \frac{3}{5}$$

$$\sin A = 0.6$$

$$A = \sin^{-1}(0.6)$$

$$A \approx 37^\circ$$

$$\cos A = \frac{4}{5}$$

$$\cos A = 0.8$$

$$A = \cos^{-1}(0.8)$$

$$A \approx 37^\circ$$

Sep 11-11:37 AM