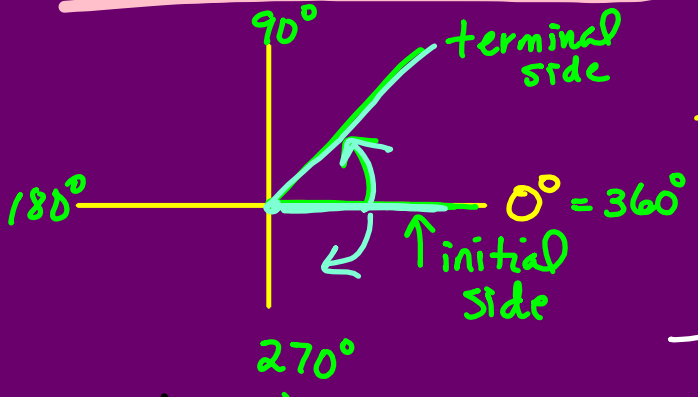
May 2, 2023

TRIGONOMETRY

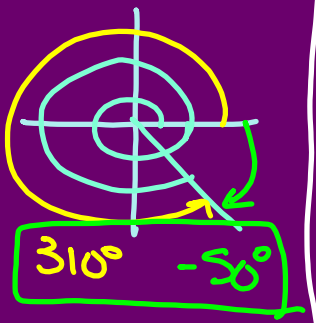
Trigonon – Triangle
Metry – Measure



Coterminal angles (Sec. 1.2)

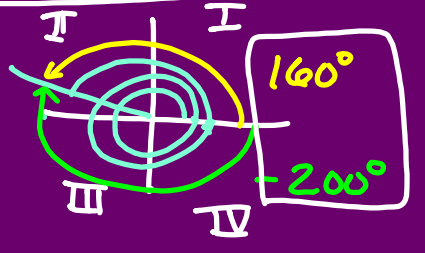
angles that share the same terminal side

$670° - 360° = 310°$



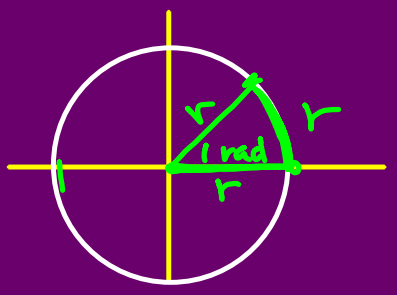
$880° - 720° = 160°$

$360° - 160° = 200°$

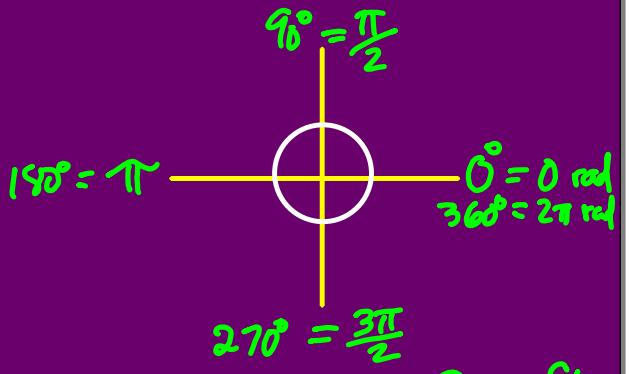


RADIANS (Sec. 3.1)

$60° \cdot 5\text{ cm} = 300\text{ deg·cm}$



$4\pi r$



$\frac{1\text{ rad}}{r} = \frac{360°}{2\pi r}$

$2\pi r\text{ rad} = 360°$

$2\pi\text{ rad} = 360°$

$\boxed{\pi\text{ rad} = 180°}$

$2\pi\text{ rad} \cdot 10\text{ ft} = 20\pi\text{ ft.}$

Degrees → Rads

$* \frac{\pi}{180}$

$140° \cdot \frac{\pi\text{ rad}}{180°}$

$= \frac{140}{180}\pi$

$= \frac{7}{9}\pi$

Radians → Degrees

$* \frac{180°}{\pi}$

$\frac{13\pi}{9} * \frac{180°}{\pi} = \frac{13 \cdot 180^{20}°}{9} = 260°$

May 2, 2023

Solving Right Δ's

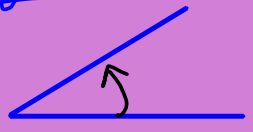
soh cah toa

$\sin A = \frac{opp}{hyp}$

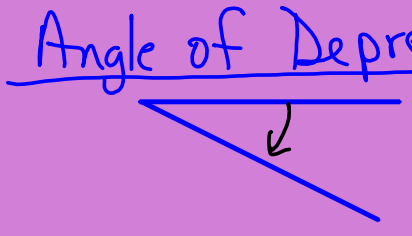
$\cos A = \frac{adj}{hyp}$

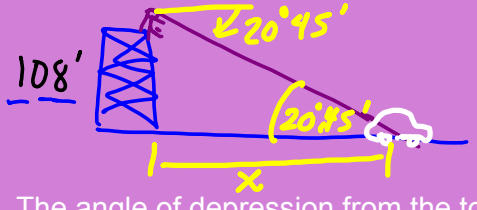
$\tan A = \frac{opp}{adj}$

Angle of elevation



Angle of Depression





The angle of depression from the top of the tower to the car is is 20°45'. How far is the car from the base of the tower?

$x \cdot \tan 20°45' = \frac{108}{x} \cdot x$

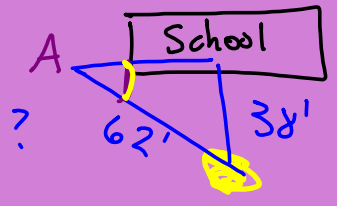
$x \cdot \tan 20°45' = 108$

$x = \frac{108}{\tan 20°45'}$

$x = 285.06$

$x = 285$ ft.

A gold deposit has been located 38' directly under NCHS. If the length of the diagonal tunnel will be 62', what is the angle of depression?



$\sin A = \frac{38}{62}$

$\sin^{-1}(38/62)$

$A = 38°$

$1° = 60'$

To find an angle, use inverse.

If need Deg/Min/Sec:
Book
Press "D"
▶ Dms

May 2, 2023

TRIG FUNCTIONS

$\sin\theta = \frac{y}{r}$ $\csc\theta = \frac{r}{y}$

stick = $\frac{\text{your}}{\text{rotten}}$

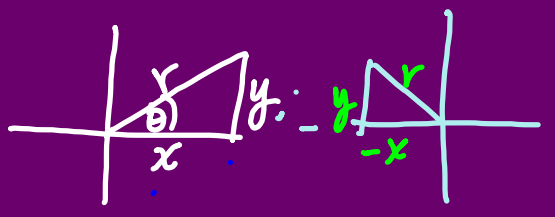
$\cos\theta = \frac{x}{r}$ $\sec\theta = \frac{r}{x}$

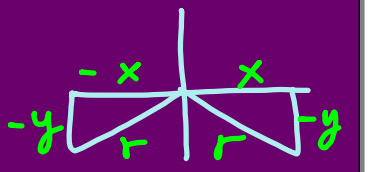
Crazy = $\frac{\text{xylophone}}{\text{right}}$

$\tan\theta = \frac{y}{x}$ $\cot\theta = \frac{x}{y}$

through = $\frac{\text{your}}{\text{x}}$

Star: $\frac{\sin\theta}{\csc\theta}$ +	All + All
Trig: $\frac{\tan\theta}{\cot\theta}$ +	$\frac{\cos\theta}{\sec\theta}$ + Class





θ theta

α alpha

β beta

γ gamma

ϕ phi

ω omega

Sec 1.4 What quadrant?

$\sin\theta \geq 0$ + $\cot\theta < 0$ −

II

$\sec\theta < 0$ $\csc\theta < 0$

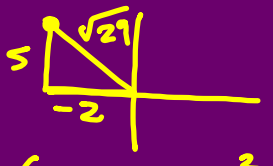
III

$\sin\theta = \frac{y}{r}$ $\quad \csc\theta = \frac{r}{y}$

$\cos\theta = \frac{x}{r}$ $\quad \sec\theta = \frac{r}{x}$

$\tan\theta = \frac{y}{x}$ $\quad \cot\theta = \frac{x}{y}$

Angle θ passes through the point (-2,5). Find sin θ.



$\sin\theta = \frac{y}{r}$

$(-2)^2 + 5^2 = r^2$

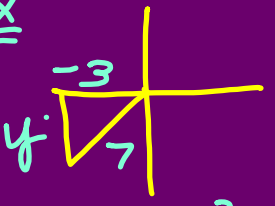
$4 + 25 = r^2$

$\sqrt{29} = \sqrt{r^2}$

$= \frac{5}{\sqrt{29}} \cdot \frac{\sqrt{29}}{\sqrt{29}}$

$= \frac{5\sqrt{29}}{29}$

If $\cos\theta = \frac{-3}{7} = \frac{x}{r}$ and $\cot\theta > 0$, find $\csc\theta$.



$(-3)^2 + y^2 = (7)^2$

$9 + y^2 = 49$

$\sqrt{y^2} = \sqrt{40}$

$y = \pm 2\sqrt{10}$ (4·10)

$y = -2\sqrt{10}$

$\csc\theta = \frac{r}{y}$

$= \frac{7}{-2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$

$= \frac{7\sqrt{10}}{-20}$

May 2, 2023