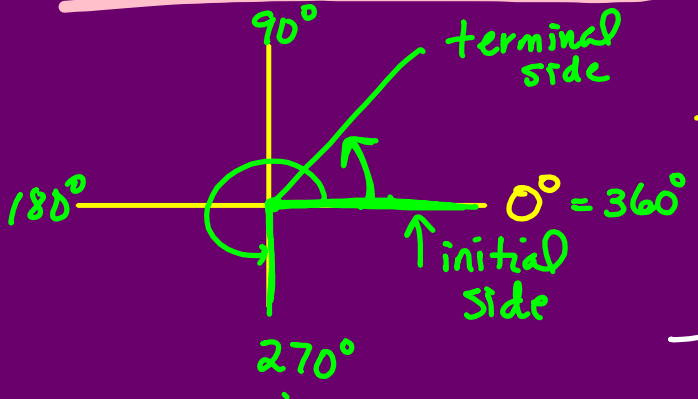
TRIGONOMETRY

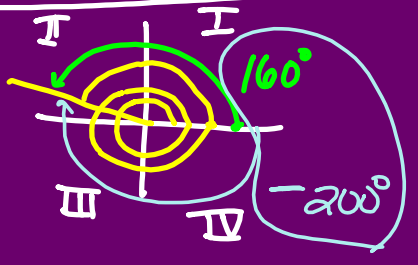
Trigonon – Triangle
Metry – Measure



Coterminal angles (Sec. 1.2)

angles that share the same terminal side

$880° - 720° = 160°$

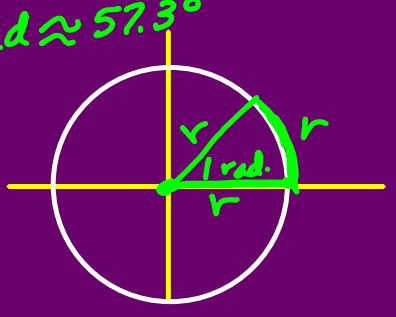


$670° - 360° = 310°$

$360° - 160° = 200°$

RADIANS (Sec. 3.1)

$1 \text{ rad} \approx 57.3^\circ$



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

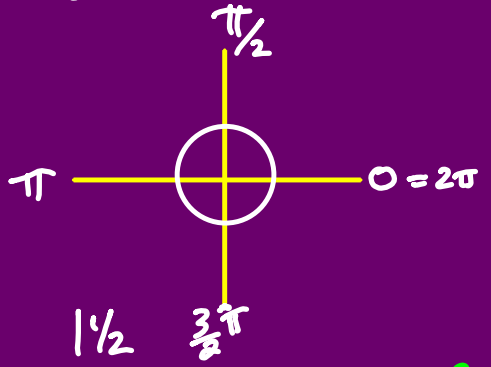
$$\frac{2\pi r \text{ rad}}{r} = \frac{360^\circ r}{r}$$

$$2\pi \text{ rad} = 360^\circ$$

$$\pi \text{ rad} = 180^\circ$$

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

$5 \text{ cm} \cdot 3\pi \text{ rad} = 15\pi \text{ cm}$



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

Degrees → Rads

$\times \frac{\pi}{180^\circ}$

$140^\circ \cdot \frac{\pi \text{ rad}}{180^\circ}$

$= \frac{140}{180}\pi = \frac{7}{9}\pi$

Radians → Degrees

$\times \frac{180^\circ}{\pi}$

$13\pi \cdot \frac{180^\circ}{\pi} = 260^\circ$

$60 \frac{\text{mi}}{\text{hr}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}}$

Solving Right Δ's

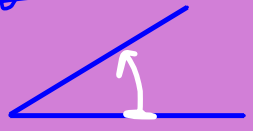
soh cah toa

$\sin A = \frac{O}{H}$ opp / hyp

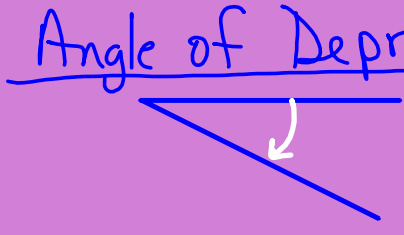
$\cos A = \frac{A}{H}$ adj / hyp

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

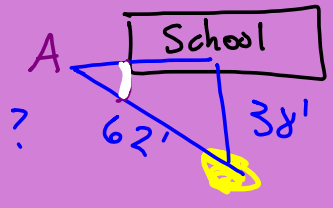
Angle of elevation



Angle of Depression



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?

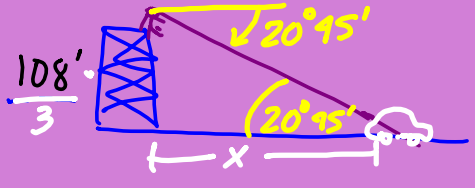


$\sin A = \frac{38}{62}$

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

$1^\circ = 60'$ ← minutes

$1' = 60''$ ← seconds



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?

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

$x = \frac{108}{\tan 20^\circ 45'}$

$x = 285$ ft.

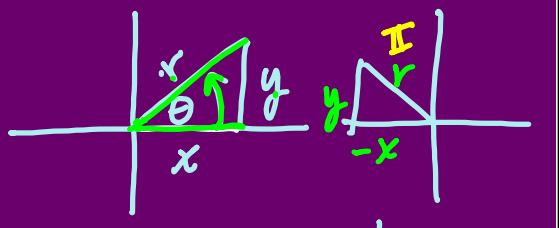
If need Deg/Min/Sec:

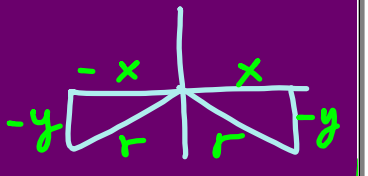
Book

Press "D"

▶ Dms

TRIG FUNCTIONS





Oh
Stick
$\sin\theta = \frac{y}{r}$ your rotten $\csc\theta = \frac{r}{y}$

Crazy
$\cos\theta = \frac{x}{r}$ xylophone right $\sec\theta = \frac{r}{x}$

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

Star	All
$\sin\theta$, $\csc\theta$ +	All +
$\tan\theta$, $\cot\theta$ +	$\cos\theta$, $\sec\theta$ +
Trig	Class

x	x
0	x

θ theta
α alpha
β beta
γ gamma
ϕ phi
ω omega

Sec 1.4 What quadrant?

$\sin\theta > 0$ + $\cot\theta < 0$ −

II

x	x
x	x

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

III

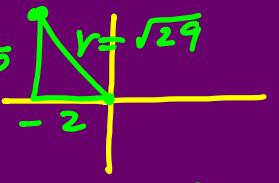
$\sin\theta = \frac{y}{r}$ $\csc\theta = \frac{r}{y}$

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

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

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

$\sin\theta = \frac{y}{r} = \frac{5}{\sqrt{29}} = \frac{5\sqrt{29}}{29}$

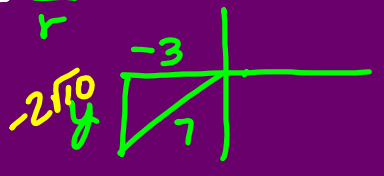


$(-2)^2 + 5^2 = r^2$

$4 + 25 = r^2$

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

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



1) Find quad

$\csc\theta = \frac{r}{y} = \frac{7}{-2\sqrt{10}} = \frac{7\sqrt{10}}{-2\sqrt{10}\cdot\sqrt{10}} = \frac{7\sqrt{10}}{-20}$

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

$y^2 + 9 = 49$

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

$y = \pm 2\sqrt{10}$

Look at pic to decide + or −