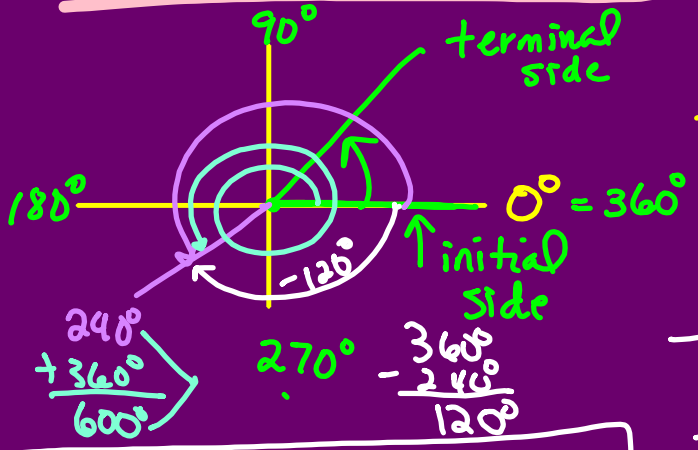
TRIGONOMETRY

Trigonon – Triangle
Metry – Measure

Coterminal angles (Sec. 1.2)

angles that share the same terminal side.

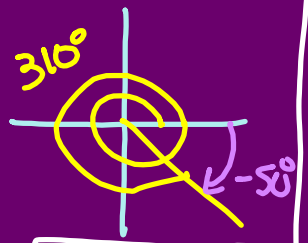


$240° + 360° = 600°$

$-360° - 240° = -120°$

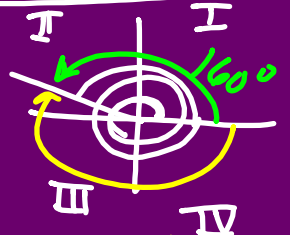
$670° - 360° = 310°$

$360° - 310° = 50°$



$310°, -50°$

$880° - 720° = 160°$



$360° - 160° = 200°$

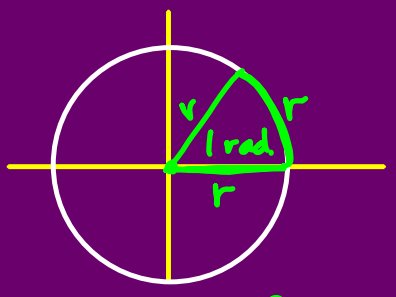
$-200°$

$160°, -200°$

RADIANS (Sec. 3.1)

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

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



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

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

$2\pi\text{ rad} = 360°$

$\boxed{\pi\text{ rad} = 180°}$

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

Degrees → Rads

$* \frac{\pi}{180°}$

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

Radians → Degrees

$* \frac{180°}{\pi}$

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

$\frac{4\text{ ft}}{\text{sec}} \cdot \frac{12\text{ in}}{1\text{ ft}}$

Solving Right Δ's

soh cah toa

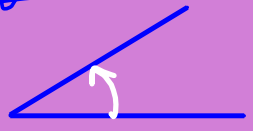
Oscar had a heap of apples

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

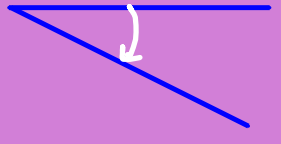
$\cos A = \frac{adj}{hyp}$

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

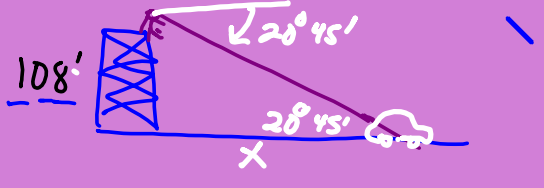
Angle of elevation



Angle of Depression



$1^\circ = 60'$ ← minutes



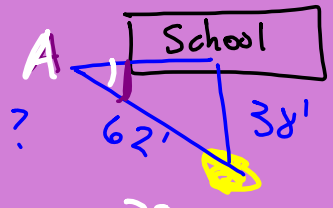
The angle of depression from the top of the tower to the car is is 20°45'. How far is the car from the base of the tower?

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

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

$x = 285$

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?



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

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

$A = 38^\circ$

If need Deg/Min/Sec: go to template Key.

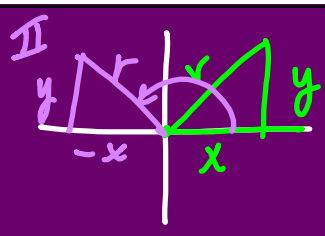
TRIG FUNCTIONS

$\sin\theta = \frac{y}{r}$ (your / rotten) $\quad \csc\theta = \frac{r}{y}$ (stick)

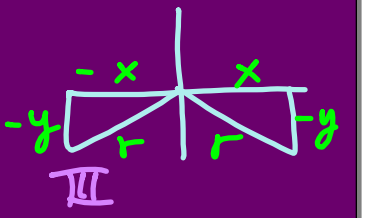
$\cos\theta = \frac{x}{r}$ (xylophone, right) $\quad \sec\theta = \frac{r}{x}$ (crazy)

$\tan\theta = \frac{y}{x}$ (your / through) $\quad \cot\theta = \frac{x}{y}$

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



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

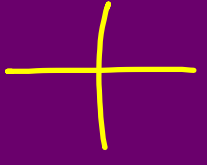


Sec 1.4 What quadrant?

$\sin\theta > 0$ (+) + $\cot\theta < 0$ (−) II

x	
x	x

$\sec\theta < 0$ $\quad \csc\theta < 0$ III

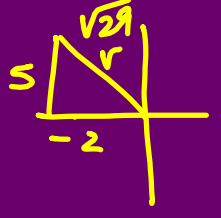


$\sin\theta = \frac{y}{r}$ $\quad \csc\theta = \frac{r}{y}$

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

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

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



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

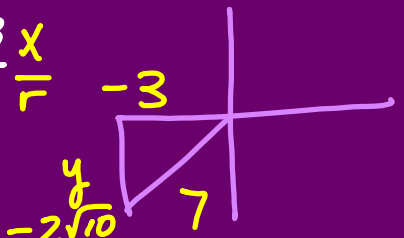
$4 + 25$

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

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

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

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



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

$9 + y^2 = 49$

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

$4 \cdot 10$

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

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

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

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