May 1, 2023

TRIGONOMETRY

Trigonon – Triangle
Metry – Measure

90°
terminal side
180°
0° = 360°
initial side
270°

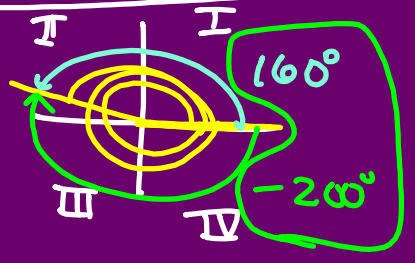
Coterminal angles (Sec. 1.2)

Share the same terminal side

670°
−360°
310°

360°
−310°
50°

310°
−50°



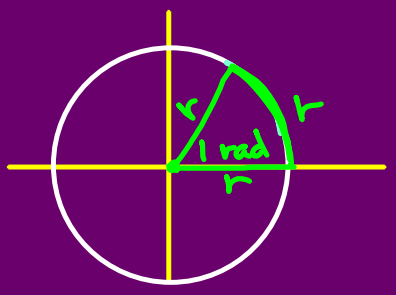
880°
−720°
160°

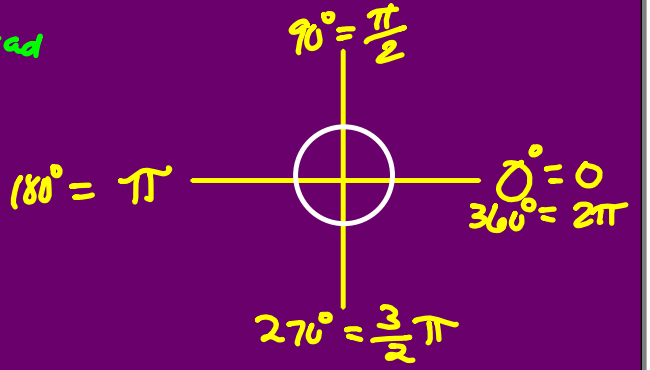
360°
−160°
200°

160°
−200°

RADIANS (Sec. 3.1)

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





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

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

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

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

2π rad · 10 ft = 20π ft.

Degrees → Rads

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

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

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

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

Radians → Degrees

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

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

TRIG FUNCTIONS

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

Stick = your rotten

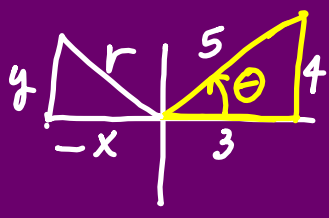
$\cos\theta = \frac{x}{r}$ $\quad \sec\theta = \frac{r}{x}$

Crazy = xylophone right

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

Through your x

II	I
Star: $\sin\theta$, $\csc\theta$ (+)	All (+)
Trig: $\tan\theta$, $\cot\theta$ (+)	Class: $\cos\theta$, $\sec\theta$ (+)
III	IV



$\csc\theta = \frac{5}{4}$

$\tan\theta = \frac{y}{3}$

θ theta

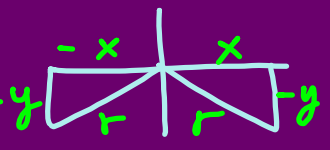
α alpha

β beta

γ gamma

∅ phi

ω omega



Sec 1.4 What quadrant?

$\sin\theta \geq 0$ (+) and $\cot\theta < 0$ (−)

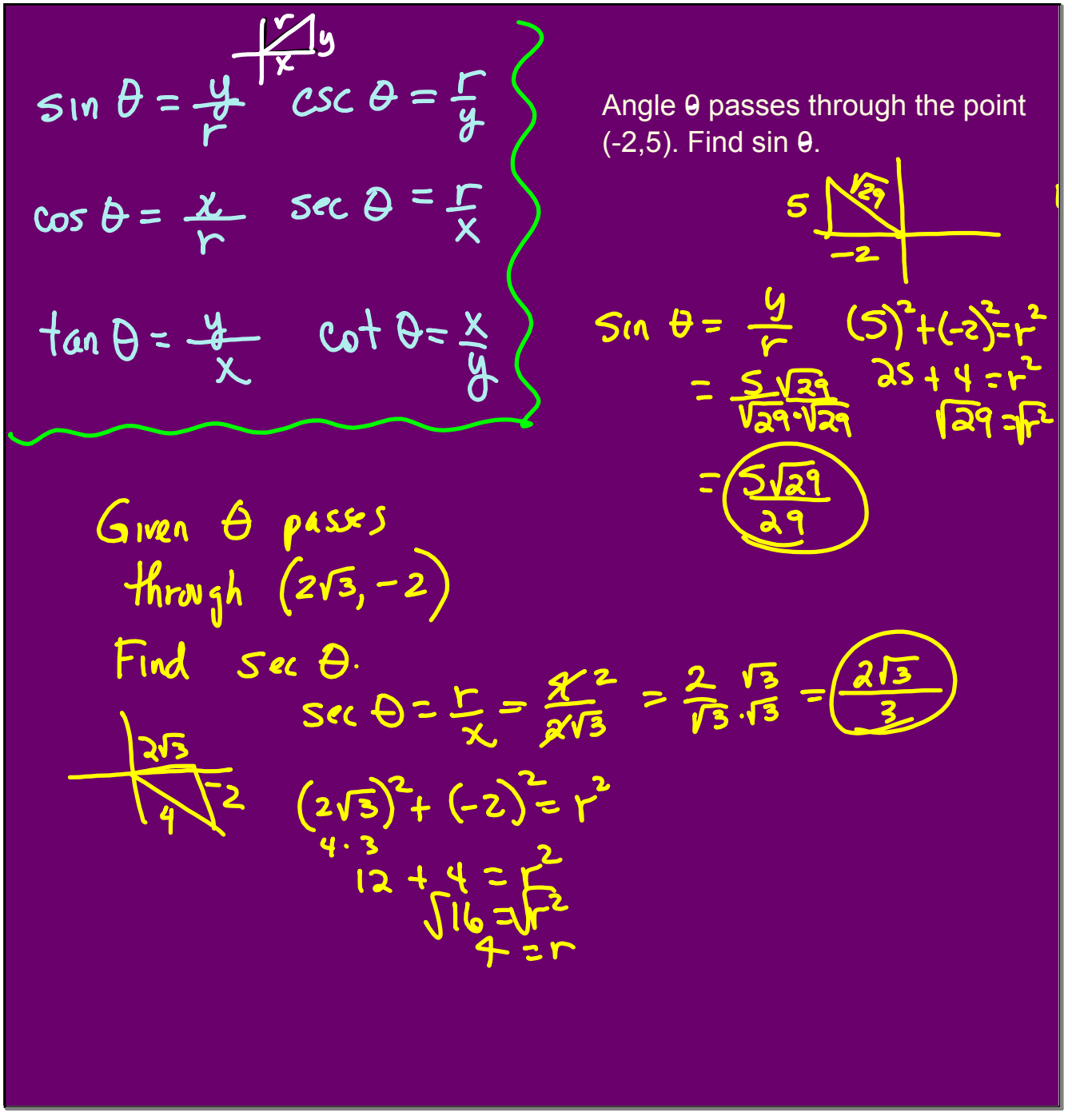
II

X	
X	X

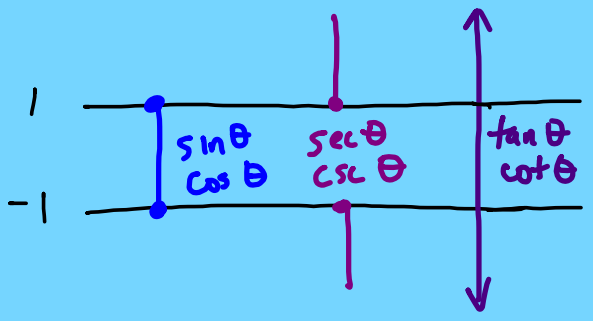
$\sec\theta < 0$ (−) $\quad \csc\theta < 0$ (−)

X	X
	X

III


r
y
x
sin θ = y/r
csc θ = r/y
cos θ = x/r
sec θ = r/x
tan θ = y/x
cot θ = x/y
Angle θ passes through the point (-2,5). Find sin θ.
√29
5
-2
sin θ = y/r
= 5/√29 · √29/√29
= 5√29/29
(5)² + (-2)² = r²
25 + 4 = r²
√29 = √r²
Given θ passes through (2√3, -2)
Find sec θ.
2√3
-2
4
sec θ = r/x = 4/2√3 = 2/√3 · √3/√3 = 2√3/3
(2√3)² + (-2)² = r²
4·3
12 + 4 = r²
√16 = √r²
4 = r

Possible/Impossible Values



Possible or Impossible?

$\cos\theta = \frac{-3}{4}$ Poss.

$\csc\theta = 100$ Poss.

$3\sin\theta - 2 = 5$

$+2 \quad +2$

$3\sin\theta = 7$

$\sin\theta = 7/3$ Imp.