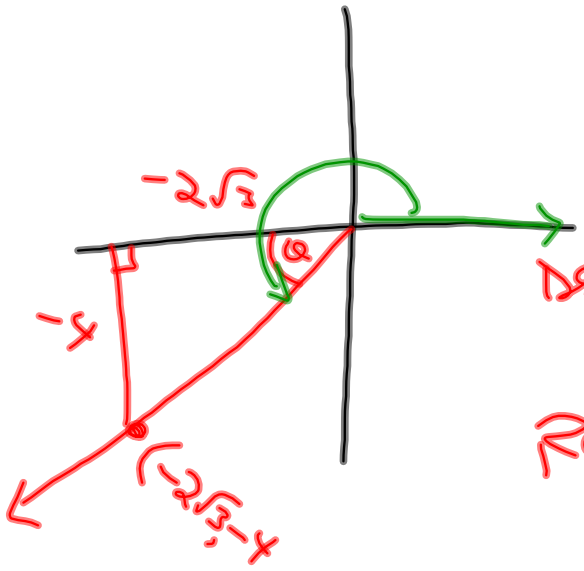
Example

Determine the measure (in radians) of an angle whose terminal arm passes through the ordered pair $\left(-2\sqrt{3}, -4\right)$



$\tan\theta = \frac{4}{2\sqrt{3}}$

Degrees

tan⁻¹(4/(2√(3)))
49.10660535

Radians

tan⁻¹(4/(2√(3)))
.8570719479

$\tan^{-1}\left(4/(2\sqrt{3})\right)$

Degrees:

$\theta = 49° + 180°$

$\theta = 229°$

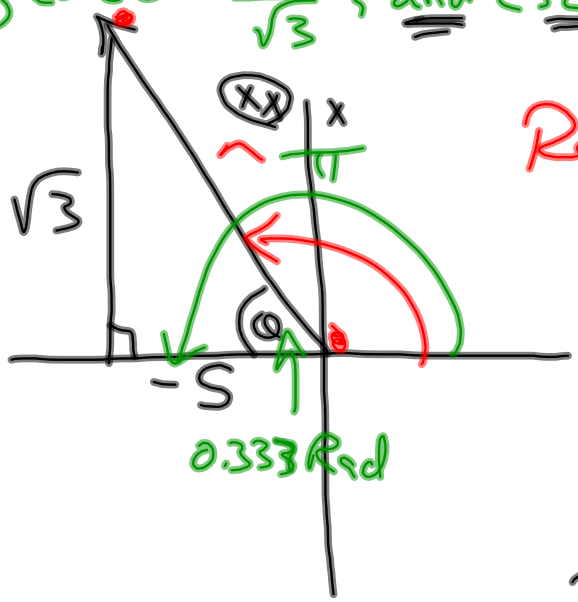
Rad: $\theta = \frac{229\pi}{180}$

Radians

$\theta = 0.857 + \pi$

$\theta = 3.99\ \text{Rad}$

① ex: $\cot\theta = \frac{-5}{\sqrt{3}}$, and $\csc\theta > 0$. Determine θ in Radians.



Ref ∠ ... (No negatives!!)

$\cot\theta = \frac{5}{\sqrt{3}}$

$\cot^{-1}\left(\frac{5}{\sqrt{3}}\right)$

$\therefore \theta = 0.333\ \text{Rad}$

$\therefore \theta = \pi - 0.333 = \underline{2.81\ \text{Rad}}$

② The terminal arm of θ passes through $(2, -2\sqrt{5})$. Determine $\csc\theta$ and θ (in Radians)

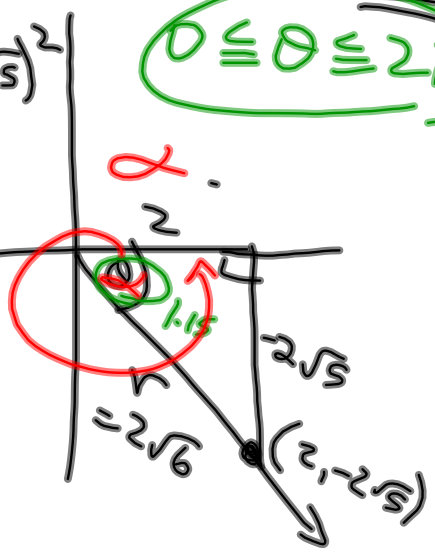
$0 \leq \theta \leq 2\pi$

$r^2 = (2)^2 + (2\sqrt{5})^2$

$r^2 = 4 + 20$

$r = \sqrt{24}$

$r = 2\sqrt{6}$



$\csc\theta = \frac{2\sqrt{6}}{2} = \sqrt{6}$

Ref ∠:

$\tan\alpha = \frac{2\sqrt{5}}{2} = \sqrt{5}$

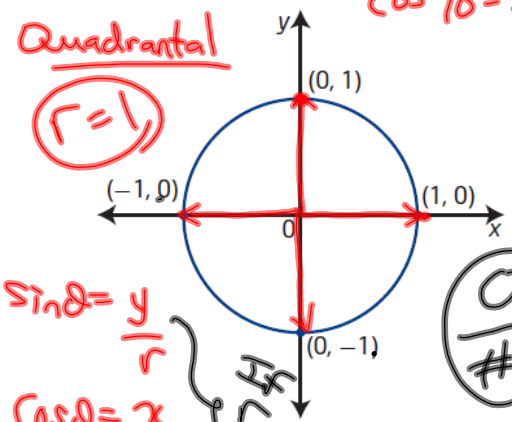
$\alpha = 1.15\ \text{Rad}$

$\theta = 2\pi - 1.15$

$\theta = 5.13\ \text{Rad}$

$\therefore \theta = -1.15\ \text{Rad}$

Unit Circle



Quadrantal

$r = 1$

$\cos 90° = \frac{0}{1} = 0$

unit circle

- a circle with radius 1 unit
- a circle of radius 1 unit with centre at the origin on the Cartesian plane is known as *the* unit circle

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

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

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

$\frac{0}{\#}$

$\frac{\#}{0}$ und

$\sec\frac{3\pi}{2}$

$r = 1$ ...

$\cos = x$

$\sin\theta = y$

$\csc\frac{\pi}{2} = 1$

(0, 1)

$\left(\frac{x}{y}\right)$

$\cot\left(-\frac{\pi}{2}\right) = 0$

(0, −1)

$\csc 3753\pi$

undefined

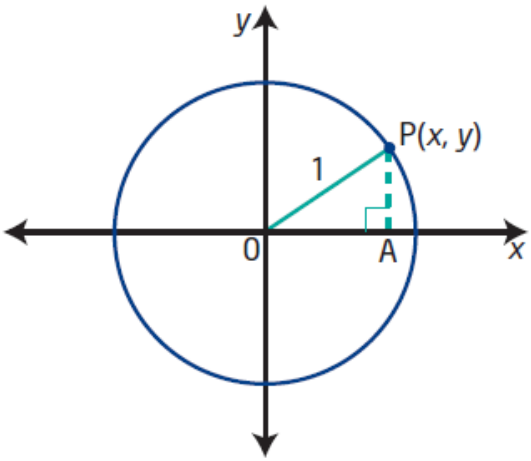
(−1, 0)

$\cos\frac{473\pi}{2} = 0$

$= \frac{472\pi}{2} + \frac{\pi}{2}$

$236\pi + \frac{\pi}{2}$

(0, 1)



centre origin . .

$x^2+y^2=(\text{radius})^2$

The equation of the unit circle is $x^2 + y^2 = 1$.

Determine the equation of a circle with centre at the origin and radius 6.

$x^2+y^2=36$