



Without a calculator determine the value of..



$$\frac{2\cos 180 + \sin 135}{\cos^2(-330)}$$

1. Find ref. angle by looking at charts (**triangles**)
2. If trig ratio is positive then ref. angle = θ
3. Find where else that trig ratio is (+) or (-)
4. Use **CAST** and appropriate equation.

Working Backwards

S	A	$\theta = 180 - \theta_R$	$\theta = \theta_R$	$\theta = \pi - \theta_R$	$\theta = \theta_R$
T	C	$\theta = 180 + \theta_R$	$\theta = 360 - \theta_R$	$\theta = \pi + \theta_R$	$\theta = 2\pi - \theta_R$

Questions from Homework

Solving Trigonometric Equations

$$2\cos\theta + 1 = 0 \text{ in the domain } 0^\circ \leq \theta \leq 360^\circ$$

$$2\cos\theta = -1$$

$$\cos\theta = -\frac{1}{2}$$

$$\theta_R = 60^\circ$$

$\cos\theta$ is negative in Q2 + Q3

Q2	Q3
$\theta = 180 - 60^\circ$	$\theta = 180 + 60^\circ$
$\theta = 120^\circ$	$\theta = 240^\circ$

$$\sin^2\theta - 1 = 0 \text{ in the domain } 0 \leq \theta \leq 2\pi$$

$$\sin^2\theta = 1$$

$$\sin\theta = \pm 1$$

$$\theta = \frac{\pi}{2}, \frac{3\pi}{2}$$

$$\sin\theta = 0.32$$

← Approximate

$$\theta = \sin^{-1}(0.32)$$

$$\theta = 18.7^\circ \text{ (Degrees)}$$

$$\theta = 0.33 \text{ (Radians)}$$

$\sin\theta$ is positive in Q1 + Q2

Q1	Q2
$\theta = 18.7^\circ$	$\theta = 180 - 18.7^\circ$
$18.7^\circ \pm 360^\circ n, n \in \mathbb{N}$	$\theta = 161.3^\circ$
	$161.3^\circ \pm 360^\circ n, n \in \mathbb{N}$

Homework

① $\sin \theta = \frac{\sqrt{3}}{2}$

$\theta_R = \frac{\pi}{3}$

 $\sin \theta$ is positive in

Q 1	Q 2
$\theta = \theta_R$	$\theta = \pi - \theta_R$
$\theta = \frac{\pi}{3}$	$\theta = \pi - \frac{\pi}{3}$

$\theta = \frac{3\pi}{3} - \frac{\pi}{3}$

$\theta = \frac{2\pi}{3}$

② $\cos \theta = -\frac{\sqrt{2}}{2}$

$\theta_R = \frac{\pi}{4}$

 $\cos \theta$ is negative in:

Q 2	Q 3
$\theta = \pi - \theta_R$	$\theta = \pi + \theta_R$
$\theta = \pi - \frac{\pi}{4}$	$\theta = \pi + \frac{\pi}{4}$
$\theta = \frac{4\pi}{4} - \frac{\pi}{4}$	$\theta = \frac{4\pi}{4} + \frac{\pi}{4}$
$\theta = \frac{3\pi}{4}$	$\theta = \frac{5\pi}{4}$

Solving Trigonometric Equations

$$\sqrt{2} \cos \theta + 1 = 0, \quad -360^\circ \leq \theta \leq 720^\circ$$

Homework

Solving Trigonometric Equations

$$\cos^2 \theta - \frac{1}{2} \cos \theta = 0, \quad -360^\circ \leq \theta \leq 720^\circ$$

$$\sin^2 \theta - \frac{\sqrt{3}}{2} \sin \theta = 0, \quad -360^\circ \leq \theta \leq 360^\circ$$

$$2 \sin^2 \theta + \sin \theta - 1 = 0 \quad 0 \leq \theta \leq 360$$

$$2 \cos^2 \theta - 7 \cos \theta + 3 = 0, 0 \leq \theta \leq 360$$