

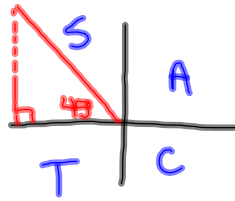


Without a calculator determine the value of...



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

P.A. 30°



$$\frac{2(-1) + \left(\frac{\sqrt{2}}{2}\right)}{\left(\frac{\sqrt{3}}{2}\right)^2}$$

$$\frac{-2 + \frac{\sqrt{2}}{2}}{\frac{3}{4}}$$

$$\frac{\frac{-4}{2} + \frac{\sqrt{2}}{2}}{\frac{3}{4}}$$

$$\frac{\sqrt{2} - 4}{2} \times \frac{4}{3} \rightarrow \frac{2\sqrt{2} - 8}{3}$$

$$\frac{4\sqrt{2} - 16}{6}$$

$$\frac{2\sqrt{2} - 8}{3}$$

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
T	C

$180 - \theta$	θ
$180 + \theta$	$360 - \theta$

Questions from Homework

⑩ $\tan^{\circ} \theta = 3$
 $\tan \theta = \pm \sqrt{3}$
 $\text{ref} = 60^{\circ}$

Quad 1 $\theta = 60^{\circ}$	Quad 2 $\theta = 180 - 60 = 120^{\circ}$
Quad 3 $\theta = 180 + 60 = 240^{\circ}$	Quad 4 $\theta = 360 - 60 = 300^{\circ}$

⑪ $\cos \theta = 0.15$
 $\text{ref} = 81.4$

<u>Quad 1</u> $\theta = 81.4^{\circ}$	<u>Quad 4</u> $\theta = 360 - 81.4 = 278.6^{\circ}$
$81.4 + 360k, k \in \mathbb{I}$	$278.6 + 360k, k \in \mathbb{I}$

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Solving Trigonometric Equations

Rearrange before solving!

$$\begin{array}{l} 2 \sin \theta = 1 \\ \sin \theta = \frac{1}{2} \end{array} \quad \text{ref} = 30 \quad \begin{array}{l} \underline{\text{Quad 1}} \\ \theta = 30^\circ \\ 30^\circ + 360k, k \in \mathbb{I} \end{array} \quad \left| \quad \begin{array}{l} \underline{\text{Quad 2}} \\ \theta = 150^\circ \\ 150^\circ + 360k, k \in \mathbb{I} \end{array}$$

$$\begin{array}{l} 2 \cos \theta + 1 = 0 \\ 2 \cos \theta = -1 \\ \cos \theta = -\frac{1}{2} \end{array} \quad \text{ref} = 60^\circ \quad \begin{array}{l} \underline{\text{Quad 2}} \\ \theta = 120^\circ \\ 120^\circ + 360k, k \in \mathbb{I} \end{array} \quad \left| \quad \begin{array}{l} \underline{\text{Quad 3}} \\ \theta = 240^\circ \\ 240^\circ + 360k, k \in \mathbb{I} \end{array}$$

Solving Trigonometric Equations

Rearrange before solving!

$$\begin{array}{l} \sqrt{2} - 2\cos\theta = 0 \\ -2\cos\theta = -\sqrt{2} \\ \cos\theta = \frac{\sqrt{2}}{2} \end{array}$$

$\text{ref} = 45^\circ$	<u>Quad 1</u>	<u>Quad 4</u>
$\theta = 45^\circ$		$\theta = 315^\circ$
$45 + 360k, k \in \mathbb{I}$		$315 + 360k, k \in \mathbb{I}$

$$\sin\theta = 0.32$$

$\text{ref} = 18.7^\circ$	<u>Quad 1</u>	<u>Quad 2</u>
$\theta = 18.7^\circ$		$\theta = 161.3^\circ$
$18.7 + 360k, k \in \mathbb{I}$		$161.3 + 360k, k \in \mathbb{I}$

Solving Trigonometric Equations

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

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

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

$$\theta = 90^\circ, 270^\circ$$

Solving Trigonometric Equations

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

$$\begin{array}{l|l} \sqrt{2} \cos \theta = -1 & \text{ref} = 45^\circ \quad \underline{\text{Quad 2}} \\ \cos \theta = -\frac{1}{\sqrt{2}} & \theta = 180 - 45 = 135^\circ \\ & \theta = 135^\circ - 360 = -225^\circ \\ & \theta = 135^\circ + 360 = 495^\circ \\ & \underline{\text{Quad 3}} \\ & \theta = 180 + 45 = 225^\circ \\ & \theta = 225^\circ - 360 = -135^\circ \\ & \theta = 225^\circ + 360 = 585^\circ \end{array}$$

Homework

Omit 4 + 7b

$$\textcircled{5} \text{ a) } (\sin\theta)(\cos\theta) = 0 \quad 0^\circ \leq \theta \leq 360^\circ$$

$$\sin\theta = 0 \quad | \quad \cos\theta = 0$$

$\theta = 0^\circ, 180^\circ, 360^\circ$	$\theta = 90^\circ, 270^\circ$
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$$\text{c) } \sin\theta(\sqrt{3} - 2\cos\theta) = 0 \quad 0^\circ \leq \theta \leq 360^\circ$$

$$\sin\theta = 0 \quad | \quad \sqrt{3} - 2\cos\theta = 0$$

$\theta = 0^\circ, 180^\circ, 360^\circ$

$$-2\cos\theta = -\sqrt{3}$$

$$\cos\theta = \frac{\sqrt{3}}{2}$$

$$\text{ref} = 30^\circ$$

$$0^\circ \leq \theta \leq 360^\circ$$

<u>Q1</u>	<u>Q4</u>
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$\theta = 30^\circ$	$\theta = 330^\circ$
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Solving Trigonometric Equations

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

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

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

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