Notes Key

Solving Easy Trigonometric Equations – With a Calculator

Solve for θ. You may use your calculator.

1. $3\sin(\theta) - 2 = 0$

$\sin\theta = \dfrac{2}{3}$

$\theta = \sin^{-1}\left(\dfrac{2}{3}\right)$

Q1 $\theta =$ Q2 $\theta =$

2. $5\cos(\theta) + 3 = 0$

$\cos\theta = \dfrac{-3}{5}$

$\theta = \cos^{-1}\left(\dfrac{-3}{5}\right)$

Q2   Q3

$\theta =$ $\theta =$

3. $5\tan(\theta) + 3 = 0$

$\tan(\theta) = -\dfrac{3}{5}$

Q2   Q4

$\theta =$ $\theta =$

Notes Key

Solving each equation for $0 \leq \theta \leq 360°$ (DEGREES)

1) $13\sin\theta - 7 = 0$

$\sin\theta = \frac{7}{13}$

$\theta = \sin^{-1}\left(\frac{7}{13}\right)$

Q1   Q2

$\theta = 32.58°$ $\theta = 147.42°$

2) $4\cos\theta + 3 = 0$

$\cos\theta = -3/4$

$\theta = \cos^{-1}\left(\frac{-3}{4}\right)$

Reference
41.41°

Q2   Q3

$\theta = 138.59°$ $\theta = 221.41°$

3) $4\tan\theta + 1 = 0$

Reference
14.04°

$\tan\theta = \frac{-1}{4}$

$\theta = \tan^{-1}\left(-\frac{1}{4}\right)$

Q2   Q4

$\theta = 165.96°$ $\theta = 345.96°$

4) $5\sin\theta + 2 = 0$

$\sin\theta = -2/5$

$\theta = \sin^{-1}\left(-\frac{2}{5}\right)$

Q3   Q4

$\theta = 204.58°$ $\theta = 336.42°$

Solving each equation for $0 \leq \theta \leq 2\pi$ (RADIANS)

1) $2\sin\theta - \sqrt{3} = 0$

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

$\theta = \sin^{-1}\left(\sqrt{3}/2\right)$

Q1 $\theta = \frac{\pi}{3}$ Q2 $\theta = \frac{2\pi}{3}$

2) $2\cos\theta + 1 = 0$

$\cos\theta = -1/2$

$\theta = \cos^{-1}(-1/2)$

Q2 $\theta = \frac{2\pi}{3}$ Q3 $\theta = \frac{4\pi}{3}$

3) $\tan\theta + 1 = 0$

$\tan\theta = -1$

$\theta = \tan^{-1}(-1)$

Q2 $\theta = \frac{3\pi}{4}$ $\theta = \frac{7\pi}{4}$
Q4

4) $2\sin\theta - \sqrt{2} = 0$

$\sin\theta = \frac{\sqrt{2}}{2}$

$\theta = \sin^{-1}\left(\sqrt{2}/2\right)$

Q1 $\theta = \frac{\pi}{4}$ Q2 $\theta = \frac{3\pi}{4}$

Solving each equation for $0 \leq \theta \leq 360°$

1) $3\tan\theta = 3\sqrt{3}$

$\tan\theta = \sqrt{3}$ $\theta = \tan^{-1}(\sqrt{3})$

$\boxed{60° \text{ and } 240°}$

2) $5 + \sin\theta = \dfrac{10-\sqrt{2}}{2} - \dfrac{5}{1}$

$\sin\theta = -\dfrac{\sqrt{2}}{2}$ $\theta = \sin^{-1}\left(-\dfrac{\sqrt{2}}{2}\right)$

$\boxed{225° \text{ and } 315°}$

(calculator)
$\theta = -16.26$ **3)** $24\tan\theta + 7 = 0$

$\theta = \tan^{-1}(-7/24)$

$\theta = 163.74°$ $\theta = 343.74°$
$\quad$ Q2 $\qquad$ Q4

4) $18\cos\theta - 10 = 0$

$\theta = \cos^{-1}(10/18)$

$\theta = 56.25°$ $\theta = 303.75°$
$\quad$ Q1 $\qquad$ Q4

Solving each equation for $0 \leq \theta \leq 2\pi$

1) $\dfrac{2-\sqrt{2}}{2} = \sin\theta + 1$

$\dfrac{2-\sqrt{2}}{2} - \dfrac{2}{2} = \sin\theta$

$\sin\theta = -\dfrac{\sqrt{2}}{2}$ $\theta = \sin^{-1}(-\sqrt{2}/2)$

$\boxed{\dfrac{5\pi}{4} \text{ and } \dfrac{7\pi}{4}}$

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

$\theta = \cos^{-1}(-1/2)$

$\boxed{\dfrac{2\pi}{3} \text{ and } \dfrac{4\pi}{3}}$

3) $-2 + \cos\theta = \dfrac{-4-\sqrt{2}}{2} + \dfrac{4}{2}$

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

$\boxed{\dfrac{3\pi}{4} \text{ and } \dfrac{5\pi}{4}}$

4) $\dfrac{1}{2} = -\dfrac{1}{2}\sin\theta$

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

$\boxed{\dfrac{3\pi}{2}}$