7.3 Trigonometric Equations

You should have a unit circle sheet. If not, this is available on the website. This allows us to see the exact values of certain angles between 0 and 360 degrees. Now we don't need to use reference angles. This section will cover how to solve trigonometric equations which is one skill you will need in calculus. The main strategy is to isolate the trig function. Then we will take the inverse trig function of both sides to get the answer.

EXAMPLE: Solve for x: $\cos x = \frac{\sqrt{3}}{2}$ on $[0,\ 360^\circ)$.

EXAMPLE: Solve for x: $-2\sin x = 1$.

EXAMPLE: Solve for x: $2\cos x + \sqrt{2} = 0$ on $[0,\ 2\pi)$.

EXAMPLE: Solve for x: $\cos^2 x = \frac{3}{4}$ on $[0,\ 2\pi)$.

EXAMPLE: Solve for x: $5\csc x - 3 = 2$ on $[0,\ 2\pi)$.

EXAMPLE: Solve for θ: $\sqrt{3}\cot\theta + 1 = 0$ on $[0,\ 360^\circ)$

EXAMPLE: Solve for θ: $\cos 2\theta = \frac{1}{2}$.

EXAMPLE: Solve for θ: $\sin(2\theta) = -\frac{\sqrt{3}}{2}$ on $[0,\ 2\pi)$.

EXAMPLE: Solve for θ: $2\sin\left(\frac{\theta}{2}\right)-1=0$ on $[0,\ 2\pi)$.

EXAMPLE: Solve the equation: $\cos^2 x-\cos x=0$ on $[0,\ 2\pi)$.

EXAMPLE: Solve the equation: $2\cos^2 x + \cos x - 1 = 0$ on $[0,\ 2\pi)$.

EXAMPLE: Solve the equation: $\sin x \cos^2 x = 2\sin x$ on $[0,\ 360^\circ)$.

EXAMPLE: Solve the equation: $\tan^3 x - \tan^2 x - 3\tan x + 3 = 0$ on $[0,\ 2\pi)$.

EXAMPLE: Solve the equation: $2\sin^2\theta - \cos 2\theta = 0$ on $[0,\ 360^\circ)$.

EXAMPLE: Solve the equation: $\sin 2\theta = \cos\theta$ on $[0,\ 2\pi)$.

EXAMPLE: Solve the equation: $2\cot^2 x + \csc^2 x - 2 = 0$ on $[0,\ 360^\circ)$.

EXAMPLE: Solve the equation: $\tan 2\theta - 2\cos\theta = 0$ on $[0,\ 360^\circ)$.