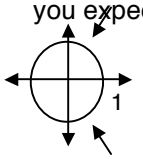
Solve: $\cos\theta = 1/2$ for θ in $[0, 2\pi)$: _____

Now suppose we are asked to solve the equation $\cos\theta = 1/3$ for θ in $[0, 2\pi)$. How many solutions do you expect this equation to have? _____



Since we don't know the value of θ exactly, we have to use the inverse cosine function. We can rewrite the equation $\cos\theta = 1/3$ in the form $\theta = \cos^{-1}1/3$ to solve for θ EXACTLY. Here's the catch...How many solutions does $\theta = \cos^{-1}1/3$ have?_____

WHEN WE USE THE INVERSE TRIG. FUNCTIONS TO SOLVE FOR θ WE WILL GET ONLY ONE SOLUTION. IF THE ORIGINAL PROBLEM HAD MORE THAN ONE SOLUTION, WE NEED TO FIND THE OTHER SOLUTIONS...EXACTLY.

For this example, $\theta = \cos^{-1}1/3$ is the solution shown in the first Quadrant. We can think of this as a reference angle and use it to find the angle in the fourth quadrant $\theta = 2\pi - \cos^{-1}1/3$. These are the exact solutions.

Try solving the following for θ in $[0, 2\pi)$:

1) $\cos\theta = -3/4$

2) $\sin\theta = 1/4$

3) $\tan\theta = -3$ Be careful...are your answers really in [0. 2π)?

4) $3\sin^2\theta + 8\sin\theta + 4 = 0$