Pre-Calculus II: Graded Worksheet: Week #3

Due on April 30, 2022 at 11:59pm

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Problem 1

Find all of the solutions to the equation $4\sin(3\theta) + 2 = 0$. Provide exact values. [4 **points**]

Solution 1

$$\begin{aligned} 4\sin(3\theta) + 2 &= 0 \\ \sin(3\theta) &= 4 - 2 \\ \sin^{-1}(\sin(3\theta)) &= \sin^{-1}(4-2) \\ t = \frac{\pi k}{3}, \ldots, k \in \mathbb{Z} & \\ \text{or} & \\ t = \frac{\pi k}{3} + 2\pi, \ldots, k \in \mathbb{Z}. & \end{aligned}$$

Problem 2

Find the solutions to the equation $4\cos(2x) = -2\sqrt{2}$. Provide exact values. [4 **points**]

Solution 2

$$\begin{aligned} 4\cos(2x) &= -2\sqrt{2} \\ \cos^{-1}(4\cos(2x)) &= \cos^{-1}(2\sqrt{2}) \\ t = \frac{3\pi}{8} + \pi k, \frac{5\pi}{8} + \pi k, k \in \mathbb{Z} & \\ \text{or} & \\ t = \frac{3\pi}{8} + 2\pi k, \frac{5\pi}{8} + 2\pi k, k \in \mathbb{Z} & \end{aligned}$$

Find the exact value of each of the following expressions. Do not use a calculator. Be sure to use proper notation to directly communicate what the given expressions equal.

- Evaluate $\sin^{-1}(\frac{-\sqrt{2}}{2})$

  What this is saying essentially is what input to to sin will produce $-\frac{\sqrt{2}}{2}$. The answer is $-\frac{\pi}{4}$.

- Evaluate $\cos^{-1}(-\frac{1}{2})$

  What this is saying essentially is what input to to cos will produce $-\frac{1}{2}$. The answer is $\frac{2\pi}{3}$.