

The Weekly Rigor

No. 270

“A mathematician is a machine for turning coffee into theorems.”

August 24, 2019

30 Problems Solving Simple Trigonometric Equations (Type II) (Part 2)

SELECTED SOLUTIONS

$$1. \csc(\theta) - 2 = 0 \Rightarrow \csc(\theta) = 2 \Rightarrow \frac{1}{\sin(\theta)} = 2 \Rightarrow \sin(\theta) = \frac{1}{2}.$$

See *WR* no. 265, problem 1, for the rest of the solution.

$$13. \sec^2(\theta) - 4 = 0 \Rightarrow \sec^2(\theta) = 4 \Rightarrow \frac{1}{\cos^2(\theta)} = 4 \Rightarrow \cos^2(\theta) = \frac{1}{4}.$$

See *WR* no. 267, problem 27, for the rest of the solution.

$$14. \sec(\theta) + 1 = 0 \Rightarrow \sec(\theta) = -1 \Rightarrow \frac{1}{\cos(\theta)} = -1 \Rightarrow \cos(\theta) = -1.$$

See *WR* no. 266, problem 19, for the rest of the solution.

$$15. \csc(\theta) + \sqrt{2} = 0 \Rightarrow \csc(\theta) = -\sqrt{2} \Rightarrow \frac{1}{\sin(\theta)} = -\sqrt{2} \Rightarrow \sin(\theta) = \frac{-1}{\sqrt{2}}.$$

See *WR* no. 265, problem 7, for the rest of the solution.

$$18. \sqrt{2} \sec(\theta) + 2 = 0 \Rightarrow \sqrt{2} \sec(\theta) = -2 \Rightarrow \sec(\theta) = \frac{-2}{\sqrt{2}} \Rightarrow \\ \Rightarrow \frac{1}{\cos(\theta)} = \frac{-2}{\sqrt{2}} \Rightarrow \cos(\theta) = \frac{-\sqrt{2}}{2} = \frac{-\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{-2}{2\sqrt{2}} = \frac{-1}{\sqrt{2}}.$$

See *WR* no. 266, problem 9, for the rest of the solution.

$$20. \csc(\theta) - 1 = 0 \implies \csc(\theta) = 1 \implies \frac{1}{\sin(\theta)} = 1 \implies \sin(\theta) = 1.$$

See *WR* no. 266, problem 13, for the rest of the solution.

$$22. 3\sec^2(\theta) - 4 = 0 \implies 3\sec^2(\theta) = 4 \implies \sec^2(\theta) = \frac{4}{3} \implies \\ \implies \frac{1}{\cos^2(\theta)} = \frac{4}{3} \implies \cos^2(\theta) = \frac{3}{4}.$$

See *WR* no. 267, problem 25, for the rest of the solution.

“Only he who never plays, never loses.”

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