

L5 – 5.4 Solve Linear Trigonometric Equations

MHF4U

In the previous lesson we have been working with identities. Identities are equations that are true for ANY value of x . In this lesson, we will be working with equations that are not identities. We will have to solve for the value(s) that make the equation true.

Remember that 2 solutions are possible for an angle between 0 and 2π with a given ratio. Use the reference angle and CAST rule to determine the angles.

When solving a trigonometric equation, consider all 3 tools that can be useful:

1. Special Triangles
2. Graphs of Trig Functions
3. Calculator

Example 1: Find all solutions for $\cos \theta = -\frac{\sqrt{3}}{2}$ in the interval $0 \leq x \leq 2\pi$

Example 2: Find all solutions for $\tan \theta = 5$ in the interval $0 \leq x \leq 2\pi$

Example 3: Find all solutions for $2 \sin x + 1 = 0$ in the interval $0 \leq x \leq 2\pi$

Example 4: Solve $3(\tan x + 1) = 2$, where $0 \leq x \leq 2\pi$