

## L5 – 5.4 Solve Linear Trigonometric Equations

MHF4U

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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  $2\pi$  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  $0 \leq x \leq 2\pi$