

Math 1060 ~ Trigonometry

14 Solving Trigonometric Equations with Multiple Trigonometric Functions

Learning Objectives

In this section you will:

- Write complete solutions to equations containing multiple trigonometric functions and/or arguments.
- Evaluate exact solutions in the interval $[0, 2\pi)$.

$\sin^2 u + \cos^2 u = 1$
 $\sin 2u = 2 \sin u \cos u$
 $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
 $c^2 = a^2 + b^2 - 2ab \cos C$

In this section, we will solve more complicated trigonometric equations:

- those having different powers of the same function.
- those having multiple trigonometric functions.
- those containing multiple trigonometric functions and/or arguments.

Some identities from previous sections will come in handy for these.

Ex 1: Solve the equation $2\cos^2 x - \cos x = 0$ and list the solutions which lie in the interval $[0, 2\pi)$.

Ex 2: Solve the equation $\sec^2 x - 2\tan x = 4$.

Ex 3: State the solutions for these equations.

a) $\tan(2x) + \tan x = 0$

b) $\sin(2x)\sin x + \cos(2x)\cos x = 1$