



# Pre-Calculus

Name: **SOLUTIONS**

Date:

Period:

## Assignment 9A.2: More Fund. Identities

Find all the exact solutions to the equation in the interval  $[0, 2\pi)$  without using a calculator.

1.  $\tan^2 x = 3$

$$\begin{aligned}\tan x &= \pm\sqrt{3} \\ x &= \tan^{-1}(\pm\sqrt{3}) \\ x &= \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}\end{aligned}$$

2.  $2\sin^2 x = 1$

$$\begin{aligned}x &= \frac{\pi}{4} \text{ or } x = \frac{3\pi}{4} \text{ or} \\ x &= \frac{5\pi}{4}, \frac{7\pi}{4}\end{aligned}$$

4.  $\tan x \sin^2 x = \tan x$

$$\begin{aligned}\tan x \sin^2 x - \tan x &= 0 \\ \tan x (\sin^2 x - 1) &= 0 \\ \tan x = 0, \quad \sin^2 x - 1 &= 0 \\ \sin x &= \pm 1 \\ x &= 0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}\end{aligned}$$

3.  $\sqrt{2} \tan x \cos x - \tan x = 0$

$$x = 0, \pi, \frac{\pi}{4}, \frac{7\pi}{4}$$

5.  $\sin x \tan^2 x - \sin x = 0$

$$x = 0, \pi, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

Find all the exact solutions to the equation in the interval  $[0, 2\pi)$  using quadratic factoring. (No calculator needed).

6.  $4\cos^2 x - 4\cos x + 1 = 0$

$$x = \frac{\pi}{3}, \frac{5\pi}{3}$$

8.  $\sin^2 t = 2 \sin t$

$$t = 0, \pi$$

7.  $2\sin^2 x + 3\sin x + 1 = 0$

$$x = \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{3\pi}{2}$$

9.  $3\sin y = 2\cos^2 y$

$$2\sin^2 y + 3\sin y - 2 = 0$$

$$x = \frac{\pi}{6}, \frac{5\pi}{6}$$