

Spiral Review

Use your graphing calculator to find the zeros of the function.

1.) $f(x) = 2x^4 - 5x^3 + 2x^2 - 7x + 4$

p.365 5.3 Solving Trigonometric Equations

Example 1: Solve the multiple-angle equation.

a.) $\sin \frac{x}{2} = 0$

$$2. \frac{x}{a} = 0 + n\pi$$

$$x = 2n\pi$$

b.) $\cos \frac{x}{4} = 0$

$$4. \frac{x}{4} = \frac{\pi}{2} + n\pi$$

$$x = 2\pi + 4n\pi$$

c.) $\tan 3t = -1$

$$\frac{3t}{3} = \frac{3\pi}{4} + \frac{n\pi}{3}$$

$$t = \frac{\pi}{4} + \frac{n\pi}{3}$$

d.) $\csc 4x = \sqrt{2}$

$$\frac{4x}{4} = \frac{\pi}{4} + \frac{2n\pi}{4} \quad \frac{4x}{4} = \frac{3\pi}{4} + \frac{2n\pi}{4}$$

$$x = \frac{\pi}{16} + \frac{n\pi}{2}$$

$$x = \frac{3\pi}{16} + \frac{n\pi}{2}$$

Students will be able to solve trigonometric equations using a graphing calculator.

Example 2: Use a graphing calculator to approximate the solutions of the equation.

** set equation equal to zero first!*

a.) $2\sin x + \cos x = 0$

2.6779
5.8195

b.) $\csc^2 x + 0.5\cot x = 5$

$\csc^2 x + .5\cot x - 5 = 0$

$\frac{1}{\sin^2 x} + \frac{.5}{\tan x} - 5 = 0$

.5153 2.7259
3.6569

Students will be able to solve trigonometric equations using the inverse.

Example 3: Use the inverse functions where necessary to solve the equation. $[0, 2\pi]$

a.) $\tan^2 x - \tan x - 2 = 0$

$(\tan x - 2)(\tan x + 1) = 0$

$\tan x - 2 = 0$ $\tan x + 1 = 0$
 $\tan x = 2$ $\tan x = -1$

$x = \arctan 2$ $x = \frac{3\pi}{4}, \frac{7\pi}{4}$

b.) $\sec^2 x + \tan x - 3 = 0$

$\tan^2 x + 1 + \tan x - 3 = 0$

$\tan^2 x + \tan x - 2 = 0$
 $(\tan x + 2)(\tan x - 1) = 0$

$\tan x = -2$ $\tan x = 1$

$x = \arctan(-2)$ $x = \frac{\pi}{4}, \frac{5\pi}{4}$

Students will be able to solve trigonometric equations using the inverse.

$$c.) 2\cos^2 x + 7\sin x = 5$$

Solve using $n\pi + 2n\pi$

$$2(1 - \sin^2 x) + 7\sin x - 5 = 0$$

$$2 - 2\sin^2 x + 7\sin x - 5 = 0$$

$$-2\sin^2 x + 7\sin x - 3 = 0$$

$$-(2\sin^2 x - 7\sin x + 3) = 0$$

$$-(\sin x - 3)(2\sin x - 1) = 0$$

$$\downarrow$$
$$\sin x - 3 = 0$$

$$\sin x = 3$$

no solution

$$\downarrow$$
$$2\sin x - 1 = 0$$

$$\sin x = \frac{1}{2}$$

$$x = \frac{\pi}{6} + 2n\pi$$

$$x = \frac{5\pi}{6} + 2n\pi$$

HW:

p.373 (63-66 all, 73-85 odds)