

1) Solve:

$$\cos^2 x = \frac{3}{4}$$

$$\cos x = \pm \frac{\sqrt{3}}{2}$$

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

$$\frac{5\pi}{6} + 2\pi k$$

$$\frac{7\pi}{6} + 2\pi k$$

$$\frac{11\pi}{6} + 2\pi k$$

Practice

$$\sin^2 x - \frac{1}{4} = 0$$

$$\sin^2 x = \frac{1}{4}$$

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

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

$$\frac{5\pi}{6} + 2\pi k$$

$$\frac{7\pi}{6} + 2\pi k$$

$$\frac{11\pi}{6} + 2\pi k$$

$$4\cos^2 x - 1 = 0$$

$$4\cos^2 x = 1$$

$$\cos^2 x = \frac{1}{4}$$

$$\cos x = \pm \frac{1}{2}$$

$$x = \frac{\pi}{3} + 2\pi k$$

$$\frac{2\pi}{3} + 2\pi k$$

$$\frac{4\pi}{3} + 2\pi k$$

$$\frac{5\pi}{3} + 2\pi k$$

2) Solve:

$$2\sin^2 x + \sin x = 0$$

$$\sin x (2\sin x + 1) = 0$$

$$\sin x = 0 \quad 2\sin x + 1 = 0$$

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

$$2\cos^2 x = \sqrt{2}\cos x$$

$$2\cos^2 x - \sqrt{2}\cos x = 0$$

$$\cos x (2\cos x - \sqrt{2}) = 0$$

$$\cos x = 0 \quad 2\cos x - \sqrt{2} = 0$$

$$\cos x \tan x - \cos x = 0$$

$$\cos x (\tan x - 1) = 0$$

$$\cos x = 0 \quad \tan x - 1 = 0$$

$$\tan x = 1$$

$$x = 0, \pi, \frac{7\pi}{6}, \frac{11\pi}{6}$$

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

x =

$$\sin^2 \theta = 2\sin \theta$$

$$\sin^2 \theta - 2\sin \theta = 0$$

$$\sin \theta (\sin \theta - 2) = 0$$

$$\sin \theta = 0$$

$$\sin \theta - 2 = 0$$

$$\theta = 0, \pi$$

$$\sin \theta = 2$$

$$\tan^2 x + \sqrt{3}\tan x = 0$$

$$\tan x (\tan x + \sqrt{3}) = 0$$

$$\tan x = 0 \quad \tan x + \sqrt{3} = 0$$

$$\tan x = 0 \quad \tan x = -\sqrt{3}$$

$$x = 0, \pi, \frac{2\pi}{3}, \frac{5\pi}{3}$$

3) Solve exactly where possible, otherwise to 2 decimal places:

$$x^2 - x - 2 = 0 \quad \sin^2 x - \sin x - 2 = 0$$

$$(x-2)(x+1) = 0 \quad (\sin x - 2)(\sin x + 1) = 0$$

$$\sin x - 2 = 0 \quad \sin x + 1 = 0$$

$$\sin x = 2 \quad \sin x = -1$$

$$x = \frac{3\pi}{2}$$

$$\cos^2 x - 6\cos x + 5 = 0$$

$$(\cos x - 5)(\cos x - 1) = 0$$

$$\cos x - 5 = 0 \quad \cos x - 1 = 0$$

$$\cos x = 5 \quad \cos x = 1$$

$$x^2 - 6x + 5 = 0$$

$$(x-5)(x-1) = 0$$

$$x = 0$$

$$(2x^2 - x - 1)$$

$$(2x+1)(x-1)$$

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

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

$$2\sin x + 1 = 0 \quad \sin x - 1 = 0$$

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

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

$$2\cos^2 \theta + 5\cos \theta - 3 = 0$$

$$(2\cos \theta - 1)(\cos \theta + 3) = 0$$

$$2\cos \theta - 1 = 0 \quad \cos \theta + 3 = 0$$

$$\cos \theta = \frac{1}{2} \quad \cos \theta = -3$$

$$\theta = \frac{\pi}{3}, \frac{2\pi}{3}$$

$$2\cos^2 x + 3\cos x = -1$$

$$2\cos^2 x + 3\cos x + 1 = 0$$

$$(2\cos x + 1)(\cos x + 1) = 0$$

$$2\cos x + 1 = 0 \quad \cos x + 1 = 0$$

$$\cos x = -\frac{1}{2} \quad \cos x = -1$$

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

$$2x^2 + 3x + 1 = 0$$

$$(2x+1)(x+1) = 0$$

$$2x^2 + 5x - 3 = 0$$

$$(2x-1)(x+3) = 0$$

4) Solve with a graphing calculator to 2 decimal places for the domain given:

$$2\sin x = \cos 3x, \text{ where } 0 \leq x < 2\pi$$

$$x = 3.45, .31$$

$$\sin x - x^2 = \log x (0 \leq x < \pi)$$

$$x = 1.21$$

5) Solve exactly using your graphing calculator ($-\pi \leq x < \pi$):

$$(\sqrt{3}\tan^2 x + \sqrt{3}\tan x) + \tan x + 1 = 0$$

$$\sqrt{3}\tan x (\tan x + 1) + 1(\tan x + 1) = 0$$

$$(\sqrt{3}\tan x + 1)(\tan x + 1) = 0$$

$$(2\cos^2 x - \sqrt{2}\cos x) + (2\cos x - \sqrt{2}) = 0$$

$$\cos x (2\cos x - \sqrt{2}) + 1(2\cos x - \sqrt{2}) = 0$$

$$(\cos x + 1)(2\cos x - \sqrt{2}) = 0$$

$$x = -\frac{\pi}{6}, \frac{5\pi}{6}, -\frac{\pi}{4}, \frac{3\pi}{4}$$

$$x = -\pi, \frac{\pi}{4}, -\frac{\pi}{4}$$

HW: MC - 9, 14, 16, 27, 37, 43, 50, 55, 57, 62, 69 WR - 1, 5