

Name:

Key

October 6, 2017

Solving Trigonometric Equations

Find the principal root(s) for each equation.

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

$$x = -\frac{\pi}{6}$$

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

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

2) $4\cos(x) - 2\sqrt{3} = 0$

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

7) $2\cos(x) = -\sqrt{2}$

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

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

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

8) $\cos^2 x = \frac{1}{2}$

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

4) $(\tan(3x))(\tan(x) - 1) = 0$

$$x = 0 \quad x = \frac{\pi}{4}$$

9) $\tan(2x) + 1 = 2$

$$x = \frac{\pi}{8}$$

5) $2\cos(2x) = -\sqrt{3}$

$$x = \frac{5\pi}{12}$$

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

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

$$11) 10 \cos(x+5) = 10$$

$$x = -5$$

$$17) \tan^2(x) = -\sqrt{3} \tan(x)$$

$$x = 0 \quad x = -\frac{\pi}{3}$$

$$12) \tan^2(3x) = 3$$

$$x = \pm \frac{\pi}{9}$$

$$18) (\tan(3x))(\tan(x)-1) = 0$$

$$x = 0 \quad x = \frac{\pi}{4}$$

$$13) 2 \sin\left(\frac{x}{4}\right) = 1$$

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

$$19) \cos^4(x) = \frac{\cos^2(x)}{4}$$

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

$$14) \sqrt{3} \tan(x) = -1$$

$$x = -\frac{\pi}{6}$$

$$20) 3 \cos(x) = -\sqrt{2} + \cos(x)$$

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

$$15) (\sin(2x))(\cos x + 1) = 0$$

$$x = 0 \quad x = \pi$$

$$21) 2 \sin^2 x - \sin x - 1 = 0$$

$$x = -\frac{\pi}{6} \quad x = \frac{\pi}{2}$$

$$16) 5 \cos(2x) = -\sqrt{3} + 3 \cos(2x)$$

$$x = \frac{5\pi}{12}$$