

4.26 Unit 4B Test Review WS #2 (Solving Trig Equations)

Solve on the interval $[0, 2\pi)$

1) $2\cos^2 x + 5\sin x = -1$

2) $4\cos^2 x - 3 = 0$

3) $\cos\left(\frac{3\pi}{2} - x\right) = -\frac{1}{2}$

4) $3\cos x = -2\sin^2 x$

5) $2\tan^2 x - \tan x - 6 = 0, \quad 0 \leq x < 2\pi$

6) $\tan^2 3x = 3$

7) Solve on the interval $[0, 2\pi)$ $\tan 4\theta = -1$

Solve the equations for all values of the variable

8) $\cos 2x - \cos x = 0$

9) $\sec 3x = 2 \tan \frac{7\pi}{4}$

10) $\cos 2x = -\frac{1}{\sqrt{2}}$

11) $\tan(\pi + x) + \tan(x + \pi) = 2$

12) $\frac{3\sec^2\theta}{4} = 1$

Trigonometric Identities

Reciprocal Identities:

$$\sin \theta = \frac{1}{\csc \theta}$$

$$\cos \theta = \frac{1}{\sec \theta}$$

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

Quotient Identities:

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

Pythagorean Identities:

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

Sum & Difference Identities:

$$\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$$

$$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan \alpha \pm \tan \beta}{1 \mp \tan \alpha \tan \beta}$$

Double-Angle Identities:

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

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

$$\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$$

$$= 2 \cos^2 \theta - 1$$

$$= 1 - 2 \sin^2 \theta$$

