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

1) $4\sec x + 8 = 0, \quad 0 \le x < 2\pi$

2) $3 \cot^2 x - 1 = 0$

3) $\tan(x+\pi) + 2\sin(x+\pi) = 0$

4) $\csc^2 x = \csc x + 2$

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

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

7) Solve on the interval $[0, 2\pi)$ $\sec 3\theta = -1$

Solve the equations for all values of the variable

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

9) $\sin 2x = 2 \tan \frac{5\pi}{4}$

10) $2\cos^2 x - 3\cos x = -1$

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

12) $\sin\left(x + \frac{\pi}{2}\right) - \cos\left(x + \frac{3\pi}{2}\right) = 0$

Trigonometric Identities

Reciprocal Identities:

$\sin\theta = \dfrac{1}{\csc\theta}$ $\qquad$ $\cos\theta = \dfrac{1}{\sec\theta}$ $\qquad$ $\tan\theta = \dfrac{1}{\cot\theta}$

$\csc\theta = \dfrac{1}{\sin\theta}$ $\qquad$ $\sec\theta = \dfrac{1}{\cos\theta}$ $\qquad$ $\cot\theta = \dfrac{1}{\tan\theta}$

Quotient Identities:

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

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

Pythagorean Identities:

$\sin^2\theta + \cos^2\theta = 1$ $\qquad\qquad$ $\tan^2\theta + 1 = \sec^2\theta$ $\qquad\qquad$ $1 + \cot^2\theta = \csc^2\theta$

Sum & Difference Identities:

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

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

Double-Angle Identities:

$\sin 2\theta = 2\sin\theta\cos\theta$ $\qquad\qquad$ $\cos 2\theta = \cos^2\theta - \sin^2\theta$ $\qquad\qquad$ $\tan 2\theta = \dfrac{2\tan\theta}{1-\tan^2\theta}$

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

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

(_,_)   (–,–)   (–,–)   (–,–)   (–,–)   (–,–)   (–,–)   (_,_)   (_,_)   (–,–)   (–,–)   (–,–)   (–,–)   (–,–)   (–,–)   (_,_)