

Solving Trig Equations with Sum & Difference Identities WSSolve each of the following over $[0, 2\pi)$.

$$1. \quad \sin\left(\frac{\pi}{2} - x\right) = \frac{1}{2}$$

$$2. \quad \sin\left(x + \frac{\pi}{3}\right) + \sin\left(x - \frac{\pi}{3}\right) = 1$$

$$3. \quad \sin\left(x + \frac{\pi}{6}\right) - \sin\left(x - \frac{\pi}{6}\right) = \frac{1}{2}$$

$$4. \quad \cos\left(x + \frac{\pi}{4}\right) - \cos\left(x - \frac{\pi}{4}\right) = 1$$

$$5. \quad \cos\left(x + \frac{\pi}{6}\right) - \cos\left(x - \frac{\pi}{6}\right) = 1$$

$$6. \quad \cos(x + 3\pi) = \cos x + \sqrt{3}$$

$$7. \quad \sin\left(x + \frac{7\pi}{2}\right) = \cos^2 x - 2$$

$$8. \quad \cos\left(x - \frac{\pi}{2}\right) + 4\sin x = 2\sin^2 x - 3$$

$$9. \quad \tan(x + 5\pi) = 2\tan x + 1$$

$$10. \quad \cos\left(x - \frac{3\pi}{2}\right) + \cos^2 x = 6 + 5\sin x$$

$$11. \quad \sin(\pi + x) = 2\sin^2 x - \sin x - 1$$

$$12. \quad \tan(x + \pi) + 2\sin(x + \pi) = 0$$

ANSWERS: 1. $\frac{\pi}{3}, \frac{5\pi}{3}$ 2. $\frac{\pi}{2}$ 3. $\frac{\pi}{3}, \frac{5\pi}{3}$ 4. $\frac{5\pi}{4}, \frac{7\pi}{4}$ 5. $\frac{3\pi}{2}$ 6. $\frac{5\pi}{6}, \frac{7\pi}{6}$ 7. 0 8. $\frac{7\pi}{6}, \frac{11\pi}{6}$
 9. $\frac{3\pi}{4}, \frac{7\pi}{4}$ 10. $\frac{3\pi}{2}$ 11. $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$ 12. $0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}$