

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

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

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

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

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

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

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

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

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

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

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

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

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

**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.  $0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}$