Solve the following for $0^\circ \leq \Theta < 360^\circ$

Part 1: Solve for the unknown variable. Give all of the exact general solutions.

1. $\sin\theta = \frac{\sqrt{2}}{2}$

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

3. $\tan\theta = 1$

4. $1 + \sin\theta = 2\cos^2\theta$

5. $2\cos^2\theta + \cos\theta = 0$

6. $\sin 3\theta = -1$

7. $\sin^2\theta - 1 = 0$

8. $\cos 2\theta = ½$

9. $2\sin^2\theta - \sin\theta - 1 = 0$

10. $\tan 4\theta = -1$

11. $\tan^2 3x = 3$

12. $\cos\frac{x}{2} = \frac{\sqrt{2}}{2}$

Solve for the unknown variable on the interval $0 \le x < 2\pi$.

1. $4\cos^2 x - 3 = 0$

2. ~~$\sqrt{2}\sin 2x = 1$~~

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

4. $\cos^3 x = \cos x$

5. $\sin x - 2\sin x \cos x = 0$

6. $2\sin^2 x - \sin x - 3 = 0$

7. $\csc^2 x - \csc x - 2 = 0$

8. $\cos^2 x = 1 - \sin x$

Solve for the unknown variable on the given interval.

9. $\sqrt{3} + \tan(2x) = 0$ on $[0, 2\pi)$.

10. $\cos(\pi x) = 0.5$ on $[0, 2)$.

11. $\sin\left(\frac{x}{2}\right) - 1 = 0$ on $[0, 8\pi)$.