Name: _____

Solving Trigonometric Equations

1) Solve each equation for exact solutions over the interval $[0, 2\pi)$

1) $\cos 2x = \frac{\sqrt{3}}{2}$

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

3) $\sin 3x = 0$

4) $\sin 3x = -1$

5) $\sin^2 \frac{3x}{2} - 2 = 0$

6) $\cot 3x = \sqrt{3}$

7) $3 \tan 3x = \sqrt{3}$

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

9) $\sin \frac{x}{2} = \sqrt{2} - \sin \frac{x}{2}$

10) $2\sqrt{3} \sin 2x = \sqrt{3}$

11) $\sin x = \sin 2x$

12) $\tan 4x = 0$

13) $\sin \frac{x}{2} = \cos \frac{x}{2}$

14) $\sec \frac{x}{2} = \cos \frac{x}{2}$

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

2) Solve the equation $2 \cos^2 x + 3 \cos x + 1 = 0$

1) For the principal values, (giving your answers in degrees)
2) For all angles between 0° and 360°
3) For all possible angles, that is, the general solution

3) Solve the equation $\cos^2 x + 2 \sin x = 1$

1) For the principal values (giving your answers in radians)
2) For all angles from 0 to 2π
3) For all possible angles, that is, the general solution

4) Solve, if possible, the following equations

1) $3 \cos t - 2 \sin t = 4$,
2) $3 \cos t - 2 \sin t = \sqrt{13}$,
3) $3 \cos t - 2 \sin t = 1$ for $0 \le t \le 2\pi$
4) $3 \sin 2t + \cos 2t = 2$

5) Show that the equation $15 \sin^2 \theta = 13 + \cos \theta$ may be written as a quadratic equation in $\cos \theta$. Hence solve the equation for θ in the range [0,360]