To solve trigonometric equations we use standard algebraic techniques such as collecting like terms and factoring. ALWAYS try to isolate the trig function in the equation.

### **Examples:**

Solve the following trig equations and give all possible solutions in the interval  $[0, 2\pi)$ .

1. Verifying Solutions of Trig Equations

Decide if the following are solutions to the equation:  $\sin 2x - \frac{1}{2} = 0$ 

a) Is 
$$x = \frac{\pi}{12}$$
 a solution?  
b) Is  $x = \frac{11\pi}{12}$  a solution?

2. Solving by getting the Trig Function alone  $2\sin\theta = 1$ 

3. Combining Like Terms (onto one side)  $\sin\theta + \sqrt{2} = -\sin\theta$ 

4. Extracting Square Roots  $3\tan^2\theta - 1 = 0$ 

5. Factoring  $\cot\theta\cos^2\theta = \cot\theta$ 

6. Factoring an Equation of Quadratic Type (may be helpful to use "u" substitution)  $2\sin^2\theta - \sin\theta - 1 = 0$ 

7. Rewriting with a Single Trig Function  $2\sin^2\theta + 3\cos\theta - 3 = 0$ 

8. Squaring and Converting to Quadratic Type (check for extraneous roots)  $\cos\theta + 1 = \sin\theta$ 

Practice!! Solve the following equations to find the ANGLE(s) in the interval  $[0, 2\pi)$ .

1) 
$$\frac{1}{2}\sec x - 1 = 0$$

2)  $3\sec^2 x - 4 = 0$ 

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

4)  $3\tan^3\theta = \tan\theta$ 

5)  $2\sin^2 x - 3\sin x = -1$ 

6)  $4\cos\theta = 1 + 2\cos\theta$