ALGEBRA 2H
Section 13.4: Solving Trigonometric Equations
NOTES - Part 2

I. Solving Trigonometric Equations

1. Most trigonometric equations have _____ unique solutions, but an infinite number of actual solutions since angles can be named many ways.

Examples: Use a calculator and/or the unit circle to solve the equations.
Find all solutions $0° \leq \theta < 360°$.

(a) $\sin\theta = \frac{1}{2}$ (b) $\cos\theta = -\frac{1}{2}$

_____ _____

2. It is possible for a trigonometric equation to only have _____ unique solution. This can happen if the solutions are $0°$, $90°$, $180°$, or $270°$.

Examples: Use a calculator and/or the unit circle to solve the equations.
Find all solutions $0° \leq \theta < 360°$.

(a) $\sin\theta = 1$ (b) $\cos\theta = -1$

_____ _____

3. It is also possible for a trigonometric equation to have 2 unique solution when using $0°$, $90°$, $180°$, or $270°$, so you always have to check for a second solution.

Examples: Use a calculator and/or the unit circle to solve the equations.
Find all solutions $0° \leq \theta < 360°$.

(a) $\sin\theta = 0$ (b) $\cos\theta = 0$

_____ _____

4. You will need to solve trigonometric equations with all 6 trig functions. Also, some equations will require other algebraic solving steps before you find the angles.

Examples: Use a calculator and/or the unit circle to solve the equations.
Find all solutions $0° \leq \theta < 360°$.

(a) $\tan\theta = 1$

(b) $\tan\theta = -\sqrt{3}$

(c) $\csc\theta = -2$

(d) $\sec\theta = \sqrt{2}$

(e) $\cot\theta + 2 = 1$

(f) $2\cos\theta = -\sqrt{3}$

5. You will also be expected to give your answers in radians. Watch the directions.

Examples: Use a calculator and/or the unit circle to solve the equations.
Find all solutions $0 \leq \theta < 2\pi$.

(a) $\sin\theta = -1$

(b) $\cos\theta = \frac{\sqrt{3}}{2}$

The Unit Circle:

Notes: The following unit circle has all the degree and radian measures for each angle and shows the coordinates of each point.

$x = \cos\theta$, $y = \sin\theta$, and $\tan\theta = \frac{y}{x}$