5.2 - Trig Functions: The Unit Circle Approach

2. Find the exact values of the six trig functions of quadrantal angles:

a.) $\theta = 0 = 0°$ b.) $\theta = 3\pi/2 = 270°$

3. Find the exact value of:

a.) $\sin(3\pi) =$ b.) $\cos(-270°) =$

4. Find the exact values of the six trig functions of $\pi/4$.

5. Find the exact values of the following expressions:

a.) $\sin 45° \cos 180° =$

b.) $\tan(\pi/4) - \sin(3\pi/2) =$

c.) $\sec(\pi/4)^2 + \csc(\pi/2) =$

6. Find the exact values of the following:

a.) $\sin 135° =$ b.) $\cos 5\pi/4 =$ c.) $\tan 315° =$

d.) $\cos 210° =$ e.) $\sin(-60°) =$ f.) $\tan 5\pi/3 =$

7. Use a calculator to approximate the value of (round to the nearest hundredth):

a.) cos 48° = b.) csc 21° = c.) tan π/12 =

-When using a circle of radius *r* to evaluate trig functions:

For any angle θ in standard position, let P(x,y) be the point on the terminal side of θ that is also on $x^2 + y^2 = r^2$

$\sin\theta = \frac{y}{r}$ $\cos\theta = \frac{x}{r}$ $\tan\theta = \frac{y}{x}$, $x \neq 0$

$\csc\theta = \frac{r}{y}$ $\sec\theta = \frac{r}{x}$ $\cot\theta = \frac{x}{y}$, $y \neq 0$

8. Find the exact value of the 6 trig functions of angle θ if (4, -3) is a point on its terminal side.

** Hint: use $x^2 + y^2 = r^2$ to find r, and then use in conjunction with the given x,y coordinates of (4, -3).

- <u>Projectile Motion:</u> The path of a projectile fired at an inclination θ to the horizontal with an initial speed of v_0 is a parabola. The range *R* of a projectile, that is, the horizontal distance that the projectile travels, is found by using the formula: $R = \frac{(v_0)^2(\sin 2\theta)^2}{g}$ where g = 32.2 ft/sec or 9.8 m/sec, is the acceleration due to gravity.

  The max height of the projectile is $H = \frac{(v_0)^2(\sin\theta)^2}{2g}$

9. Find the range R and the max height H of a projectile fired at 30° to the horizontal with an initial speed of 150 meters/sec.