Name: ______________________ Date: ______________________

Period: ________ Trigonometry: ***6.2 Practice***

1. Solve the equation for θ if $0° \le \theta < 360°$. Give your answer in degrees.

$\sec\theta - 2\tan\theta = 0$

$\frac{1}{\cos\theta} - \frac{2\sin\theta}{\cos\theta} = 0$

$1 - 2\sin\theta = 0$

$1 = 2\sin\theta$

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

$\theta = 30°, 150°$

2. Solve the equation for θ if $0° \le \theta < 360°$. Give your answer in degrees.

$\sin 2\theta + \sin\theta = 0$

$2\sin\theta\cos\theta + \sin\theta = 0$

$\sin\theta(2\cos\theta + 1) = 0$

$\sin\theta = 0$

$\theta = 0, 180°$

$2\cos\theta + 1 = 0$

$\theta = 120°, 240°$

3. Solve the equation for x if $0 \le x < 2\pi$. Give your answer in radians using exact values only.

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

$\sin x - (1 - 2\sin^2 x)$

$\sin x - 1 + 2\sin^2 x = 0$

$2\sin^2 x + \sin x - 1 = 0$

$(2\sin x - 1)(\sin x + 1)$

$2\sin x - 1 = 0$

$\sin x = 1/2$

$x = \frac{\pi}{6}, \frac{5\pi}{6}$

$\sin x = -1$

$x = \frac{3\pi}{2}$

4. Solve the equation for x if $0 \le x < 2\pi$. Give your answer in radians using exact values only.

$2\cos^2 x - \sin x - 1 = 0$

$2(1 - \sin^2 x) - \sin x - 1 = 0$

$2 - 2\sin^2 x - \sin x - 1 = 0$

$0 = 2\sin^2 x + \sin x - 1$

5. Solve the equation for x if $0 \le x < 2\pi$. Give your answer in radians using exact values only.

$2\cos x - \tan x - \sec x = 0$

$2\cos x - \frac{\sin x}{\cos x} - \frac{1}{\cos x} = 0$

$2\cos^2 x - \sin x - 1 = 0$

$2(1-\sin^2 x) - \sin x - 1 = 0$

$2 - 2\sin^2 x - \sin x - 1 = 0$

$2\sin^2 x + \sin x - 1 = 0$

$(2\sin x - 1)(\sin x + 1)$

$2\sin x = 1$ $\quad$ $\sin x = -1$

$\sin x = \frac{1}{2}$

$x = \pi/6, 5\pi/6$ $\quad$ $x = \frac{3\pi}{2}$

6. Solve the equation for θ if $0° \le \theta < 360°$. Give your answer in degrees.

$\sin\theta + \sqrt{3}\cos\theta = -\sqrt{3}$

$\sin\theta = -\sqrt{3} - \sqrt{3}\cos\theta$

$\sin^2\theta = 3 + 6\cos\theta + 3\cos^2\theta$

$1 - \cos^2\theta = 3 + 6\cos\theta + 3\cos^2\theta$

$0 = 2 + 6\cos\theta + 4\cos^2\theta$

$0 = 2\cos^2\theta + 3\cos\theta + 1$

$(2\cos + 1)(\cos + 1) = 0$

$2\cos\theta + 1 = 0$

$\cos\theta = -1/2$ → Extra.

$\theta = 120°, 240°$

$\cos\theta + 1 = 0$

$\cos\theta = -1$

$\theta = 180°$

7. Find all degree solutions for the equation in the interval $0° \le \theta < 360°$.

$7\sin^2\theta - 9\cos 2\theta = 0$

$7\sin^2\theta - 9(1 - 2\sin^2\theta) = 0$

$7\sin^2\theta - 9 + 18\sin^2\theta = 0$

$25\sin^2\theta = 9$

$\sin^2\theta = \frac{9}{25}$

$\sin\theta = \frac{\pm 3}{5}$

$\hat{\theta} = 36.9°$

$\sin\theta = \frac{3}{5}$ $\quad$ $\sin\theta = \frac{-3}{5}$

$\theta = 36.9°, 143.1°$ $\quad$ $\theta = 216.9°$

$\theta = 323.1°$

8. Solving the following equation will require you to use the quadratic formula. Solve the equation for θ between 0° and 360°, and round your answers to the nearest tenth of a degree.

$9\cos^2\theta + 6\sin\theta - 5 = 0$

$9(1 - \sin^2\theta) + 6\sin\theta - 5 = 0$

$9 - 9\sin^2\theta + 6\sin\theta - 5 = 0$

$-9\sin^2\theta + 6\sin\theta + 4 = 0$

$\sin\theta = \frac{-6 \pm \sqrt{36 - 4(-9)(4)}}{-18}$

$\sin\theta = \frac{-6 \pm 6\sqrt{5}}{-18}$

$\sin\theta = -0.412$ $\quad$ $\sin\theta = 1.07$

$\hat{\theta} = 24.33$ $\quad$ No Sol.

$\theta = 204.33, 335.67$