Pre-Calculus
Mid-Chapter Review (plus some)

Name: Key
Date: Period:

1. Convert between degrees and radians or vice versa.

   a) $324°$ $\frac{324\pi}{180} = \frac{9\pi}{5}$

   b) $\frac{5\pi}{9} = 100°$ $\frac{5(180)}{9}$

2. Evaluate without a calculator.

   a) $\tan\frac{2\pi}{3} = -\sqrt{3}$ $\frac{\sin 2\pi/3}{\cos 2\pi/3} = \frac{\sqrt{3}/2}{-1/2}$

   b) $\sec\frac{3\pi}{4} = \sqrt{2}$ $\frac{1}{\cos} = \frac{1}{\sqrt{2}/2}$

3. If $\csc x = 4$, the other 5 trig values.

   $\sin x = \frac{1}{4}$ $\cos x = \sqrt{15}/4$ $\tan x = \frac{\sqrt{15}}{15}$ $\sec x = \frac{4\sqrt{15}}{15}$ $\cot x = \sqrt{15}$

   $c^2 + 1^2 = 4^2$ $c^2 = 1 - 1/16 = 15/16$

4. Find $\sin\left(\cos^{-1}\left(\frac{12}{13}\right)\right)$ without a calculator.

   $\frac{5}{12}$

5. Graph each function.

   $y = 1 + 4\cot\left(\frac{x}{2} + \frac{\pi}{6}\right)$

   $f(x) = 3\sec\left(2x + \frac{3\pi}{2}\right) + 2$

   $f(x) = -2 + 3\csc\left(\frac{x}{4} + \frac{3\pi}{8}\right)$

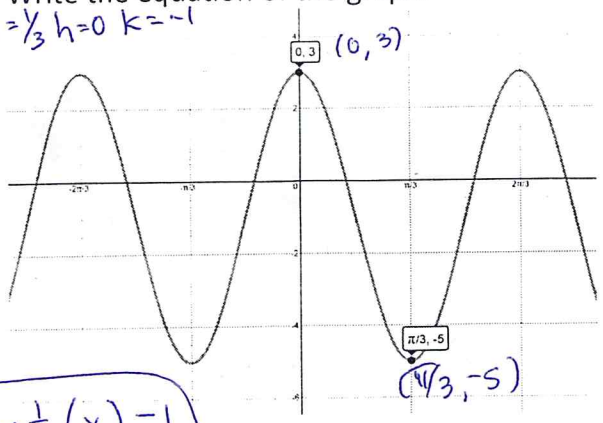
   $y = \frac{1}{4}\tan\left(4x + \frac{4\pi}{3}\right) - 1$

   See next Page for graphs.

6. Write the equation of the graph.

   $a = 4$ $b = 1/3$ $h = 0$ $k = -1$

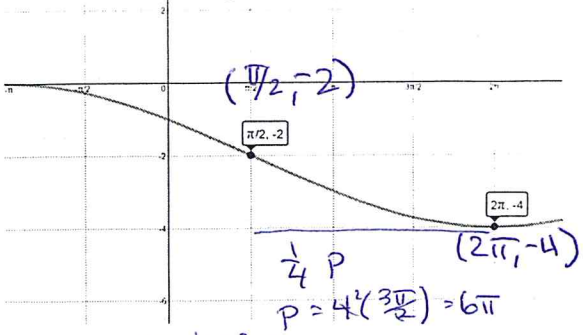
   $P = \frac{2\pi}{3}$ $\frac{2\pi}{3} \cdot b = 2\pi$ $b = 1/3$

   $y = 4\cos\frac{1}{3}(x) - 1$

   $y = -2\sin\frac{1}{3}(x - \pi/2) - 2$

   $a = -2$ $b = \frac{1}{3}$ $h = R\pi/2$ $k = -2$

   $\frac{1}{4}P$ $P = 4^2(\frac{3\pi}{2}) = 6\pi$

   $6\pi \cdot b = 2\pi$ $b = \frac{1}{3}$

7. Solve. Pay attention to the given domain.

   a) $\sin x = -0.56;\ 0 \le x < 2\pi$

   b) $\cos x = 0.9832;\ 0 \le x < \pi$

   c) $\tan x = -22;\ 0 \le x < -\pi$

   d) $\cos x = -0.1161;\ -\frac{\pi}{2} \le x < -\frac{3\pi}{2}$

8. Solve.

   a) $-2\sin 3x - 7 = -6.2$

   b) $6\cos\pi(x + 11) + 0.5 = 3.7$

See next Pages for answers to #7 & 8

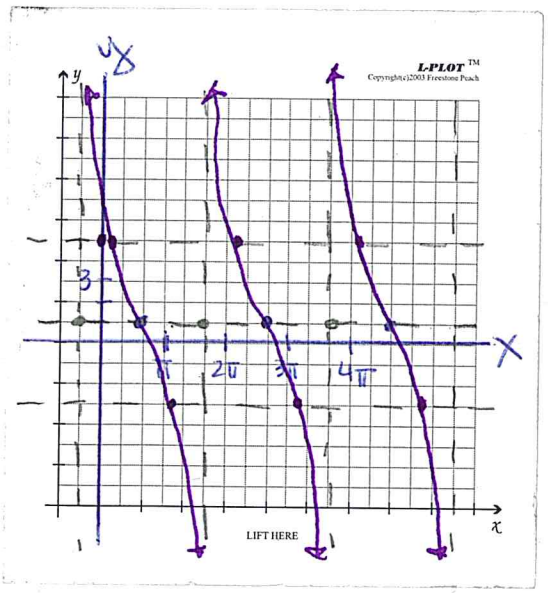
5. graph. $\frac{1}{2}(x+\pi/3)$

a) $y = 1 + 4\cot\left(\frac{x}{2} + \pi/6\right)$

$a=4 \quad b=\frac{1}{2} \quad h=-\pi/3$

$K=1 \quad P=4\pi$

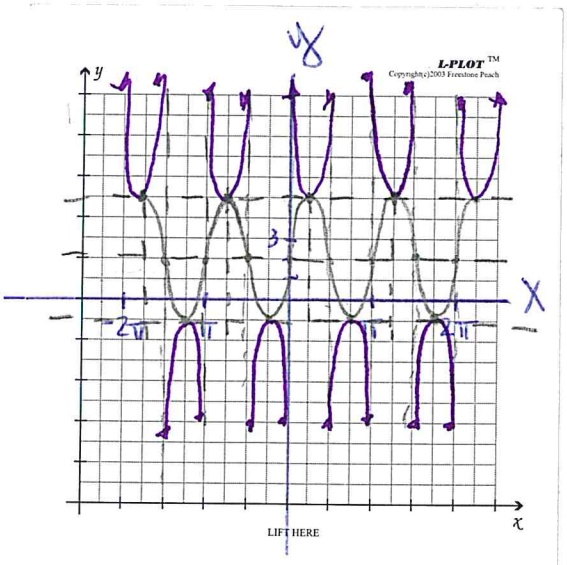
$\cot = \frac{\cos}{\sin}$



b) $f(x) = 3\sec 2\left(x + \frac{3\pi}{4}\right) + 2$

$a=3 \quad b=2 \quad h=-\frac{3\pi}{4} \quad K=2$

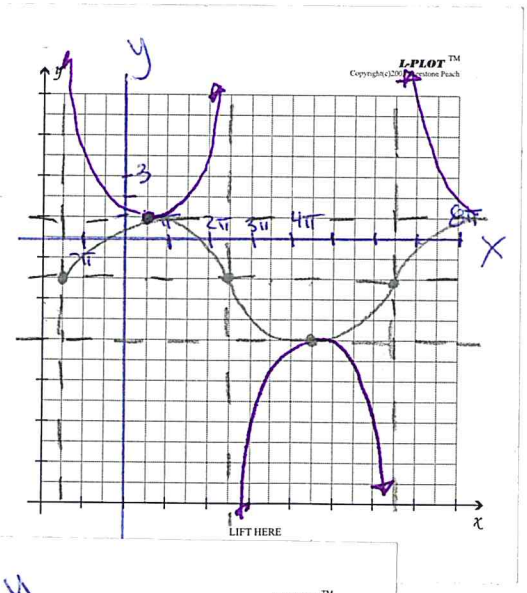
$P=\pi \quad \sec = 1/\cos$



c) $f(x) = -2 + 3\csc\frac{1}{4}\left(x + \frac{3\pi}{2}\right)$

$a=3$ w/reflection $\quad b=1/4 \quad h=\frac{-3\pi}{2} \quad K=-2$

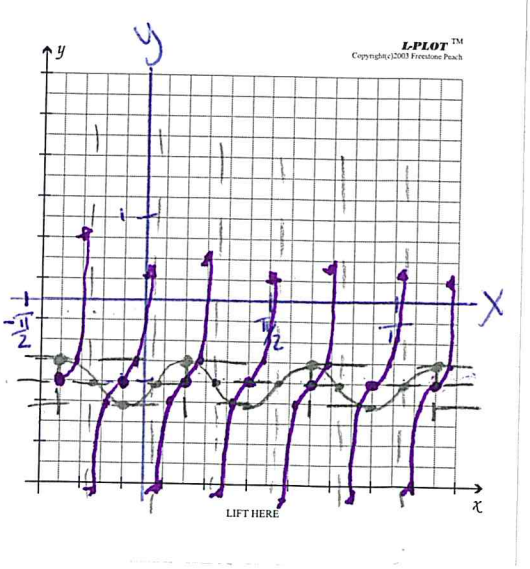
$P=8\pi \quad \csc = \frac{1}{\sin}$



d) $y = \frac{1}{4}\tan 4\left(x + \frac{\pi}{3}\right) - 1$

$a=1/4 \quad b=4 \quad h=-\pi/3 \quad K=-1$

$P=\frac{\pi}{2} \quad \tan = \frac{\sin}{\cos}$

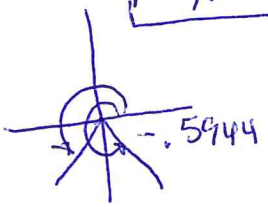


7 a) $\sin x = -.56;\ 0 \le x < 2\pi$

$x = \sin^{-1}(-.56)$

$x = -.5944$

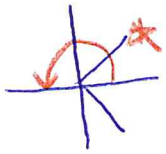
$\boxed{x = 5.6888,\ x = 3.7360}$



b) $\cos x = .9832;\ 0 \le x < \pi$

$x = \cos^{-1}(.9832)$

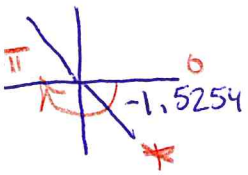
$\boxed{x = .1836}$



c) $\tan x = -22;\ 0 \le x < \pi$

$x = \tan^{-1}(-22)$

$\boxed{x = -1.5254}$

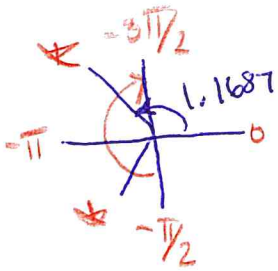


d) $\cos x = -0.1161;\ -\frac{\pi}{2} \le x < -\frac{3\pi}{2}$

$x = \cos^{-1}(-0.1161)$

$x = 1.687$

$\boxed{x = -4.5960,\ x = -1.687}$



8 a) $-2\sin 3x - 7 = -6.2$

$\frac{-2\sin 3x}{-2} = \frac{.8}{-2}$

$\sin 3x = -.4$

$\sin^{-1} 3x = \sin^{-1}(-.4)$

$\frac{3x}{3} = \frac{\sin^{-1}(-.4)}{3}$

$x = \frac{\sin^{-1}(-.4)}{3} \approx -.1372$

b) $6\cos\pi(x+11) + .5 = 3.7$

$\frac{6\cos\pi(x+11)}{6} = \frac{3.2}{6}$

$\cos\pi(x+11) = \frac{3.2}{6}$

$\pi(x+11) = \cos^{-1}\left(\frac{3.2}{6}\right)$

$x+11 = \frac{\cos^{-1}\left(\frac{3.2}{6}\right)}{\pi}$

$x = \frac{\cos^{-1}\left(\frac{3.2}{6}\right)}{\pi} - 11$

≈ -10.6791