Sections Covered: 6.4, 6.1, 6.2, 6.3, 6.5, 6.6, 7.4 (In *Miller*: 5.1–5.7 all)

**Calculator Policy:** Calculator use may be allowed on part of the exam. When instructions call for an **exact** solution, that indicates that a decimal approximation will not be accepted.

*This review is provided as a courtesy to give some idea of what material is covered. Nothing else is intended or implied.*

(1) Given one trigonometric value of an acute angle, find the remaining five trigonometric values.

    (a) $\cot \alpha = 3$

    (b) $\sec \beta = \dfrac{7}{2}$

    (c) $\sin \sigma = \dfrac{12}{13}$

(2) Evaluate each expression exactly without a calculator.

    (a) $\sin 30° \cos 45°$

    (b) $\csc 60°$

    (c) $\sin 60° - 2 \sin 30° \cos 30°$

(3) Suppose the angle $\theta$ has terminal side in quadrant III when in standard position and that $\tan \theta = \frac{7}{6}$ determine the remaining five trigonometric values of $\theta$.

(4) A regular pentagon is inscribed in a circle of radius 10. Find the perimeter of the pentagon.

(5) From a hot air balloon 2 km high, the angles of depression of two towns in line with the balloon and on the same side of the balloon are $81°$ and $13°$. How far apart are the towns (to the nearest km)?

(6) Evaluate each trigonometric expression exactly if it exists. (Check with a calculator, but be

able to do this without one. You can be sure I will ask you to do so on an exam.)

(a)  $\cos\left(\frac{3\pi}{2}\right)$

(b)  $\cot\left(2\pi\right)$

(c)  $\csc\left(\frac{5\pi}{6}\right)$

(d)  $\sin\left(\frac{11\pi}{6}\right)$

(e)  $\tan\left(\frac{3\pi}{4}\right)$

(f)  $\cos\left(\frac{5\pi}{4}\right)$

(g)  $\sec\left(\frac{5\pi}{2}\right)$

(h)  $\sec\left(\frac{2\pi}{3}\right)$

(i)  $\tan\left(\frac{5\pi}{3}\right)$

(7) State the domain and range of each of the six trigonometric functions. Use interval notation or set builder notation.

(8) Identify the amplitude and period of each of each function.

(a)  $f(x) = -3\cos\left(\frac{x}{2}\right) - 2$   (b)  $g(x) = 4 - 4\sin\left(\pi x + \frac{\pi}{6}\right)$   (c)  $F(x) = 4\sin\left(\frac{\pi}{4} - 2x\right)$

(9) State the domain and the range of each of $f(x) = \sin^{-1}(x)$, $g(x) = \cos^{-1}(x)$ and $H(x) = \tan^{-1}(x)$ using interval notation.

(10) Evaluate each expression exactly if it exists. If it doesn't exist, state why.

(a) $\sin\left(\sin^{-1} 0.02\right)$

(b) $\sin^{-1}\left(\sin 0.02\right)$

(c) $\sin^{-1}\left[\sin\left(\pi\right)\right]$

(d) $\cos^{-1}\left[\cos\left(-\frac{\pi}{4}\right)\right]$

(e) $\cos\left(\tan^{-1} 4\right)$

(f) $\csc\left[\cos^{-1}\left(\frac{2}{3}\right)\right]$

(11) Plot at least two full periods of each of $y = \sin x$, $y = \cos x$, and $y = \tan x$.

(12) Match the following functions with the plots shown. Note that not all of the functions will be used.

(a)  $f(x) = 2 - \cos\left(x + \frac{\pi}{4}\right)$   (b)  $f(x) = \sin(4x)$   (c)  $f(x) = -2\sin(2x) + 1$

(d)  $f(x) = -3\cos x + 1$   (e)  $f(x) = -\cos(3x) + 1$   (f)  $f(x) = \frac{1}{2}\sin(2x) - 2$

(g)  $f(x) = 2 + \cos\left(\frac{\pi x}{4} - \frac{\pi}{2}\right)$   (h)  $f(x) = \cos\left(\frac{x}{4}\right)$   (i)  $f(x) = \sin\left(x - \frac{\pi}{4}\right)$

(i)

(ii)

(iii)

(iv)

(v)

(vi)