1. (7pts) Sketch pictures of the angles and use the unit circle to find the values of the trigonometric functions indicated. Do not use a calculator.

$$\sin 450° \qquad\qquad\qquad\qquad\qquad\qquad \sin \frac{5\pi}{3}$$

$$\tan 450° \qquad\qquad\qquad\qquad\qquad\qquad \cos \frac{5\pi}{3}$$

2. (3pts) State the angles for which $\csc\theta$ is not defined. Explain. (Hint: looking at the unit circle and writing what $\csc\theta$ is in terms of x and y coordinates may help.)

3. (6pts) Use the odd-even and periodicity properties to figure out:
a) If $\sin\theta = 0.7$, what is $\sin(-\theta)$?
b) If $\cos\theta = 0.4$, what is $\cos(-\theta)$?
c) If $\sin\theta = 0.5$, what is $\sin\theta + 2\sin(\theta + 2\pi) - 3\sin(\theta - 6\pi)$?

d) If $\tan\theta = 2$, what is $3\tan\theta + 2\tan(-\theta) - 4\tan(\theta + 3\pi)$?

4. (5pts) Sketch at least two cycles of the graph of $y = \cos x$. On one of the cycles indicate what the x-intercepts are and where the peaks and valleys occur. What is the period of the function?

5. (5pts) a) Sketch at least two cycles of the graph of $y = \tan x$. Indicate what the x-intercepts are and where the asymptotes occur. What is the period of the function?
b) What is the connection between where the asymptotes are and the graph of $y = \cos x$?

6. (8pts) Sketch the graph of $y = -3\sin 2x$. Use the following to accurately draw the graph:
a) What is the amplitude of the function?
b) What is the period of the function?
c) Indicate all the characteristic points on the graph (x-intercepts, peaks, valleys).

7. (8pts) Sketch the graph of $y = 4\cos(\pi x - \pi)$. Use the following to accurately draw the graph:
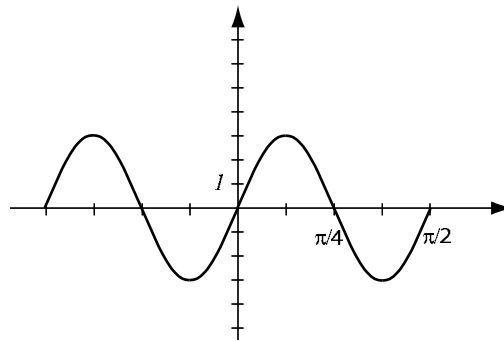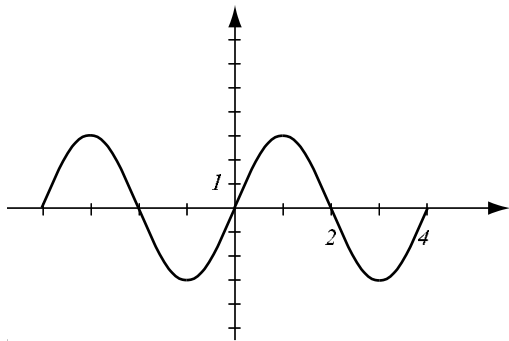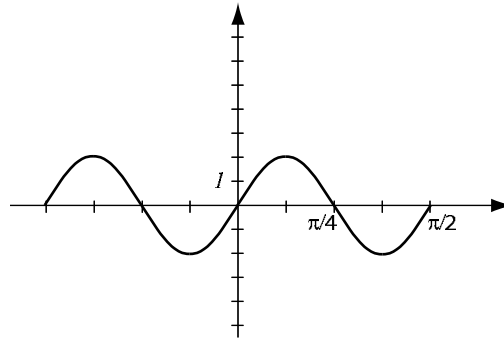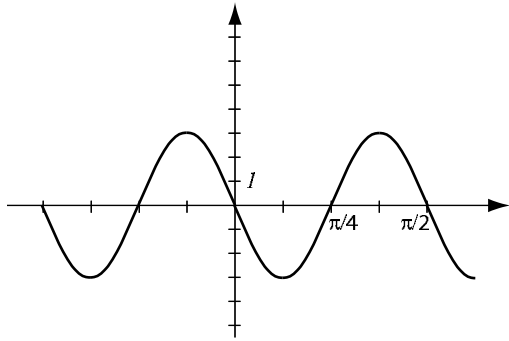a) What is the amplitude of the function?
b) What is the period of the function?
c) What is the phase shift of the function?
d) Indicate all the characteristic points on the graph (x-intercepts, peaks, valleys).

8. (8pts) Match the graph of the function with one of the equations. Explain your choices by using amplitude, period and phase shift.

$$y = 3\sin\left(\frac{\pi}{2}x\right) \qquad y = 2\sin 4x \qquad y = 3\sin(4x + \pi) \qquad y = 3\sin 4x$$

Bonus (5pts) Sketch the graph of $y = \sec 3x$. Indicate where the asymptotes and the peaks and valleys are. What is the period?