How to use this practice midterm: This list of sample problems should give you an idea of what I think is important for the first midterm. The real midterm will not simply be these problems with a few numbers changed, but the real problems will at least cover the same concepts.

Therefore, when you do these problems you should do more than sit in front of your textbook and compare them to examples until you can do them. You should see, for instance, that I think the equation $y = A\cos(\omega x - \phi)$ is important. So instead of only learning how to do the sample problem here, you shold learn what the different pieces of this equation mean, so that you can do any problem related to it.

A favorite trick of teachers is to give a sample midterm problem, and then "reverse" it on the exam. For example, on the exam I could give you a picture of a certain sine wave and ask you to find an equation $y = A\sin(\omega x - \phi)$ whose graph matches the picture. (And this is why I say you should understand the concepts behind the sample problems, and not just the sample problems themselves.)

#1. Given $y = 3\cos(\pi x - \frac{\pi}{2})$, find the amplitude, period, and phase shift of this function. Graph at least one period.

#2. Given that $\sin(\theta) = 1/2$ and $cos(\theta) < 0$, find the values of all the trig functions.

#3. Find exact values of the trig functions for $\theta = -\pi/4, 3\pi/4, and \pi/4$.

#4. Show that

$$\frac{\cot(\theta)\sin(\theta)}{\sec(\theta)} + \frac{1}{\csc^2(\theta)} = 1$$

(Hint: write everything in terms of sines and cosines.)

#5. Find the points on the unit circle corresponding to the following angles:

$$0, \pi/6, \pi/4, \pi/3, \pi/2, 2\pi/3, 3\pi/4, 5\pi/6, \pi$$

You may wish to do the same for a circle of radius 2, as well.

#6. Find $cos^{-1}(\cos(-\pi/4))$.

#7. Convert 95° to radians. Then convert 1 radian to degrees.

#8. Graph $y = \tan\left(x - \frac{\pi}{2}\right)$.

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