Math 1151, Exam 1
Friday February 5, 10:10-11:00

Name: _____

Discussion Section: _____

Discussion TA: _____

This exam has 7 problems. Make sure to show all your work and circle your final answer. This exam is closed book and closed notes. You may not use a calculator.

1. (*9 points*) **Measure of Angles**

   (a) Draw the unit circle, and draw the 5 standard angles in the first quadrant. Label each angle in radians.

   (b) Convert the angles

      i. from radians to degrees:

      $$\frac{7\pi}{4} =$$

      ii. from degrees to radians:

      $$-120^\circ =$$

2. (*10 points*) Evaluate $\sin\theta$ and $\cos\theta$ for the 5 standard angles.

θ	$\sin\theta$	$\cos\theta$

3. (*8 points*) Write $\tan\theta$, $\cot\theta$, $\sec\theta$, and $\csc\theta$ in terms of $\sin\theta$ and $\cos\theta$. (These are the "fundamental identities.")

$\tan\theta \ =$

$\cot\theta \ =$

$\sec\theta \ =$

$\csc\theta \ =$

4. (*12 points*) Find the length of the arc subtended by a central angle of 45° on a circle of radius 2 feet. What is the area of the sector? (You may use the approximation $\pi \approx 3$.)

5. (*13 points*) Find the exact value of each of the other trigonometric functions.

$$\tan\theta = \tfrac{1}{4},\ 0 < \theta < \tfrac{\pi}{2}$$

6. (*24 points*) **Graphing a sinusoidal function**

   (a) Graph $y = \cos x$.

   (b) Find the amplitude, period, and phase shift of the function

   $$y = -\cos(\tfrac{1}{2}x + \tfrac{\pi}{2})$$

   (c) Graph the function in part (b).

7. (*24 points*) **Graphing secant and a transformation**

   (a) State the domain, range, and period of $y = \sec x$. Is it even or odd?

   (b) Graph $y = \sec x$.

   (c) Graph $y = 4\sec(\frac{\pi}{2}x)$.

Scratch paper. (*If you want your work on this page to be graded, make sure to label your work according to the problem you're solving, and make sure to write a note next to the original problem.*)