EXAM 5 - MATH 140
DATE: Friday, November 10
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 5 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Copy the following table and, then, fill-in the appropriate values (5 points). All given angles are in radians.

θ	$\frac{3\pi}{4}$	$\frac{11\pi}{6}$	$\frac{7\pi}{3}$
$\sin\theta$			
$\cos\theta$			

2. Suppose that the point $(-2, -5)$ is on the terminal side of the angle θ that is placed in standard position.

   (a) Find $\sin\theta$ and $\cos\theta$. (3 points)

   (b) Find $\tan\theta$ and $\cot\theta$. (1 point)

   (c) Find $\sec\theta$ and $\csc\theta$. (1 point)

3. Suppose that $\tan\theta = 4$ and that $\pi < \theta < \frac{3\pi}{2}$.

   (a) Find $\sec\theta$. (2 points)

   (b) Find $\cos\theta$. (1 point)

   (c) Find $\sin\theta$. (2 points)

4. (a) Roughly sketch the graph of $f(x) = \cos x$ in one period showing me all important points. (1 point)

   (b) Which transformations should be performed on that graph to obtain the graph of $g(x) = \frac{3}{2}\sin\left(\frac{1}{2}x - \frac{\pi}{4}\right)$? (2 points)

   (c) Use the second part to obtain a graph of $y = g(x)$. (2 points)

5. Consider the function $f(x) = 3\sin\left(2x + \frac{\pi}{2}\right)$.

   (a) Find its amplitude. (0.5 points)

   (b) Find its period. (1 point)

   (c) Find its phase shift. (1 point)

   (d) Roughly sketch the graph of f based on the amplitude and the period. (Do not worry about the scaling on the coordinate axes but depict **clearly all** interesting points.) (2.5 points)