

PRACTICE EXAM 4 - 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 | $\frac{7\pi}{4}$ | $\frac{5\pi}{6}$ | $\frac{4\pi}{3}$ |
|---------------|------------------|------------------|------------------|
| $\sin \theta$ | | | |
| $\cos \theta$ | | | |

2. Suppose that the point $(7, -3)$ 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 $\cos \theta = \frac{4}{5}$ and that $\frac{3\pi}{2} < \theta < 2\pi$.
- (a) Find $\sin \theta$. (2 points)
 - (b) Find $\tan \theta$ and $\cot \theta$. (1 point)
 - (c) Find $\sec \theta$ and $\csc \theta$. (1 point)
 - (d) Find $\sin(\pi + \theta)$. (1 point)
4. (a) Roughly sketch the graph of $f(x) = \sin x$ in one period showing me all important points. (1 point)
- (b) Which transformations should be performed on that graph to obtain the graph of $g(x) = \frac{3}{2} \sin(2x - \pi)$? (2 points)
- (c) Use the second part to obtain a graph of $y = g(x)$. (2 points)
5. Consider the function $f(x) = -5 \sin(6x + 3\pi)$.
- (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. (2.5 points)