

TEST 8 - MATH 140

DATE: Friday, March 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. (a) Convert $\frac{4\pi}{5}$ radians to degrees. (1 point)
 (b) Convert 195° to radians. (1 point)
 (c) If the radius of a circle is 3 meters, find the length of the arc of the circle and the area of the sector subtended by the central angle $\theta = 120^\circ$. (1 point)
 (d) The radius of each wheel of a car is 15 inches. If the wheels are turning at the rate of 3 revolutions per second, how fast is the car moving? (You may express your answer in whichever units you prefer.) (2 points)
2. Copy the following table and, then, fill-in the appropriate values (5 points). All given angles are in radians.

θ	$\frac{7\pi}{4}$	$\frac{5\pi}{6}$	$\frac{4\pi}{3}$
$\sin \theta$			
$\cos \theta$			

3. 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)
4. 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)
5. (a) Give me formally (as done in class) the domain $\text{Dom}(f)$ of $f(\theta) = \cot \theta$. (2 points)
 (b) Write down the three Pythagorean identities. (2 points)
 (c) Find the exact value of the expression

$$\sin 1^\circ + \sin 2^\circ + \sin 3^\circ + \dots + \sin 357^\circ + \sin 358^\circ + \sin 359^\circ$$

(1 point).