

Name: _____

PID: _____

NOTE: You must show the steps necessary to arrive at your answer unless otherwise noted. Use your judgment, if you can't do the entire problem in your head, then you probably should write down at least some intermediate steps.

This assignment has 9 pages. There are 61 total points.

Problem 1 (4 points). Compute the following, or state if they are undefined:

(a) $\sec\left(\frac{\pi}{2}\right)$

(b) $\tan\left(\frac{4\pi}{3}\right)$

(c) $\tan(0^\circ)$

(d) $\csc(-150^\circ)$

Problem 2 (8 points). Suppose $\sin(\theta) = 0.4$ and $\cos(\theta) = .92$. Compute the following to two decimal places. You *may* use a calculator - *you must write down the calculation you use to find the answer*.

(a) $\cot(\theta)$

(b) $\csc(\theta)$

(c) $\tan(\theta)$

(d) $\sec(\theta)$

Problem 3 (4 points). What is the domain and range of $f(x) = \sin(x)$? What is the domain and range of $g(x) = \cos(x)$?

Problem 4 (8 points). Find the **range** of the following functions:

(a) $r(y) = 4 \sin(y)$

(b) $p(a) = -3 \cos(a)$

(c) $k(t) = \cos(t) + 2$

(d) $g(s) = -2 \sin(t) + 5$

Problem 5 (3 points). True or False.

_____ The period of $f(\alpha) = 2 \cos(\alpha)$ is 2π .

_____ $g(x) = 3 \sin(x) + 2$ is an odd function.

_____ $h(z) = -2 \cos(z)$ is an even function.

Problem 6 (4 points). If $\cos(\beta) = -0.43$, what is $\cos(-\beta) + \cos(\beta + 4\pi)$? *Hint: Use your knowledge of even/odd functions and periodic functions*

Problem 7 (5 points). Find the period of the following sinusoidal functions:

(a) $T(x) = 3 \sin(x) + 2$

(b) $k(y) = \sin(2y)$

(c) $r(s) = \sin(-2s)$

(d) $q(u) = 2 \cos(3u)$

(e) $w(x) = -4 \cos\left(\frac{x}{10}\right)$

Problem 8 (8 points). Compute the following without the use of a calculator.

(a) $\sin(-600^\circ)$

(b) $\tan(3\pi)$

(c) $\cos\left(\frac{25\pi}{6}\right)$

(d) $\sec\left(\frac{-3\pi}{4}\right)$

Problem 9 (4 points). Describe the function $k(x) = 2 \cos(x) + 5$ in terms of transformations of $f(x) = \cos(x)$.

Sketch a graph of $k(x)$ without the use of a calculator. Label the tick marks on your axes so the units are clear.

Problem 10 (4 points). Describe the function $l(y) = \sin(-\pi + y)$ in terms of transformations of $g(y) = \sin(y)$.

Sketch a graph of $l(y)$ without the use of a calculator. Label the tick marks on your axes so the units are clear.

Problem 11 (9 points). Simplify the following expressions into a single trig function with no fractions.

These are a bit more difficult than the problems we did in lecture. If you do not know where to start, try a few different methods (the solution isn't always clear). As always, be sure to go back and check your work at the end too.

(a) $\frac{1-\sin^2(\theta)}{\sin^2(\theta)}$ (*Hint: The Pythagorean Identity says that $\cos^2(\theta) + \sin^2(\theta) = 1$*)

(b) $\frac{\cot(x)}{\csc(x)} \cdot \sec(x)$

(c) $\frac{\tan(y)}{\sec(y)-\cos(y)}$

[OPTIONAL]

Survey Questions.

How much time during the week did you spend working on this assignment specifically?

What are the top two resources you use to study for the midterms? (the word "resource" can mean whatever makes sense to you)