

Oregon Institute of Technology Dual Credit Program

Math 112, Spring 2019

Exam 2

Name: _____

Show any relevant work. For each problem, circle your final answer

1. (15 points) For each value of t given below, find the reference number t' and the coordinates of the terminal point determined by t . Include a reference angle sketch.

a. $t = \frac{5\pi}{4}$

b. $t = -\frac{7\pi}{6}$

2. (15 points) Find the exact value of each of the following. Include a reference angle sketch.

a. $\sec\left(-\frac{\pi}{4}\right)$

b. $\tan\left(\frac{7\pi}{3}\right)$

3. (16 points) Suppose $\sin x = -\frac{8}{17}$ and $\cos x > 0$. Find the following: (Include a reference triangle)

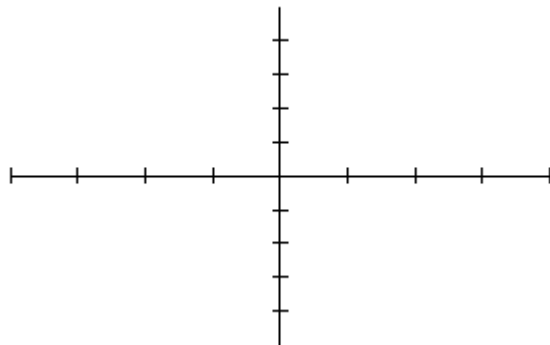
a. $\sin(-x)$

b. $\tan(x)$

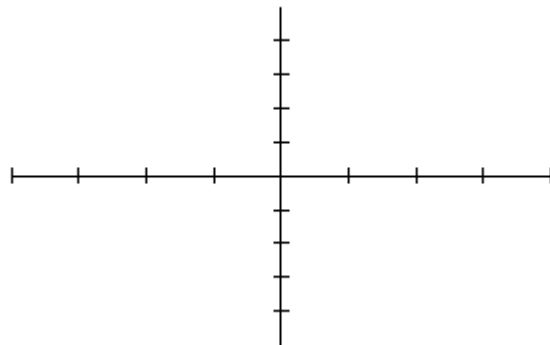
4. (6 points) For what values of x is $\tan^{-1}(\tan x) = x$?

5. (16 points) For each of the following functions, sketch one period of the graph carefully. Label the grid sufficiently to indicate the period, amplitude and asymptotes.

a. $f(x) = 2\cos 2\pi(x + 3)$



b. $f(x) = \frac{1}{2}\tan(\pi x)$



6. (16 points) Find the exact values of each of the following. Include a reference angle sketch.

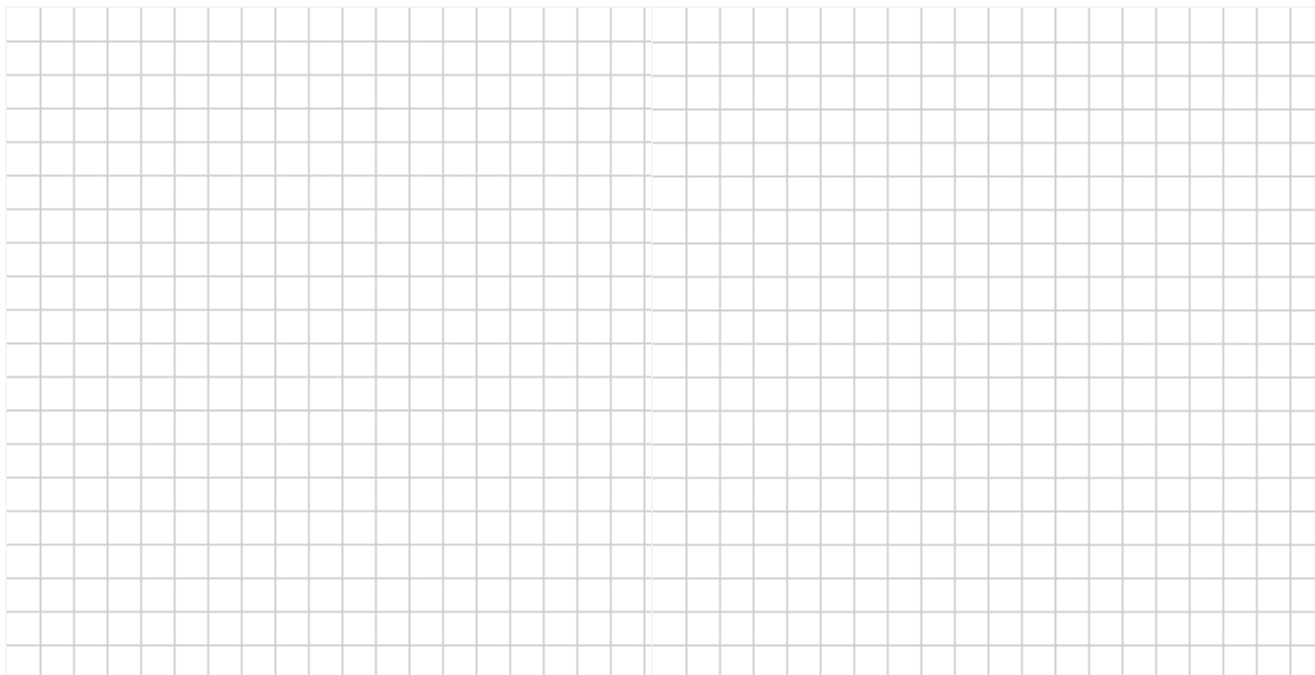
a. $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$

b. $\cos^{-1}\left(\tan\left(\frac{5\pi}{3}\right)\right)$

c. $\sin^{-1}\left(\sin\left(\frac{5\pi}{4}\right)\right)$

7. (16 points) The alternating half-daily cycles of the rise and fall of the ocean are called tides. Tides in one section of the Bay of Fundy (Canada!!) cause the water level to rise $6.5m$ above mean sea level and drop $6.5m$ below. The tide completes one cycle every 12 hours . Assuming the height of water with respect to mean sea level is modeled by a sine function;

a) Sketch a graph that models the position of the water in reference to mean sea level for one complete day. (be sure and label your axes)



b) Find an equation for this model.

c) What is the maximum displacement between low tide and high tide?