

+100

Eastern Oregon University
Concurrent Enrollment/Credit by Proficiency Program

Math 112, Spring, 2014

Exam 2

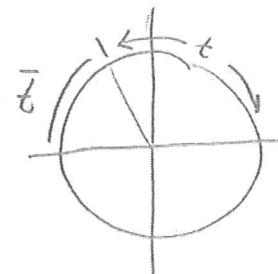
name/school: Key

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

1. (12 points) For each value of t given below, find the reference number \bar{t} and the coordinates of the terminal point determined by t .

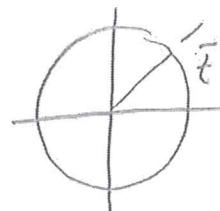
a. $t = 2\pi/3$

$$\bar{t} = \frac{\pi}{3} + 2$$
$$(-\frac{1}{2}, \frac{\sqrt{3}}{2}) + 4$$



b. $t = 9\pi/4$

$$\bar{t} = \frac{\pi}{4} + 2$$
$$(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}) + 4$$

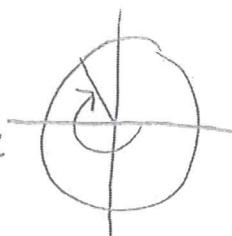


2. (12 points) Find the exact value of each of the following.

a. $\cos(-4\pi/3)$

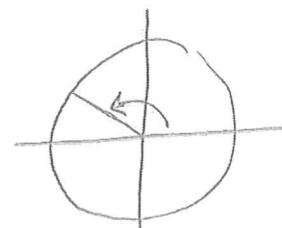
$$= -\frac{1}{2}$$

6 pictures not required but can earn partial credit



b. $\tan(5\pi/6) = \frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \Theta \frac{1}{\sqrt{3}}$

+6



3. (6 points) Find $\sin x$ if $\sin(-x) = .7$.

$$\therefore 7 = \sin(-x) = -\sin x, \text{ so } \sin x = -7$$

+3

(not required)

30/30

4. (18 points) The point $(-\frac{\sqrt{5}}{4}, \frac{\sqrt{11}}{4})$ is the terminal point determined by a real number t . Find each of the following:

a. $\sin t = \frac{\sqrt{11}}{4} \boxed{+6}$

simplification not required,
but must be correct
if attempted, i.e. -2 for
error

b. $\sec t = \frac{-4}{\sqrt{11}} \boxed{+6}$

c. $\cot t = \frac{-\sqrt{5}}{4} / \frac{\sqrt{11}}{4} = -\frac{\sqrt{5}}{4} \cdot \frac{4}{\sqrt{11}} = \frac{-\sqrt{5}}{\sqrt{11}} \text{ or } -\sqrt{\frac{5}{11}}$

5. (8 points) a. For what values of x is $\sin(\sin^{-1} x) = x$?

For x in $[-1, 1]$, or $-1 \leq x \leq 1 \boxed{+4}$

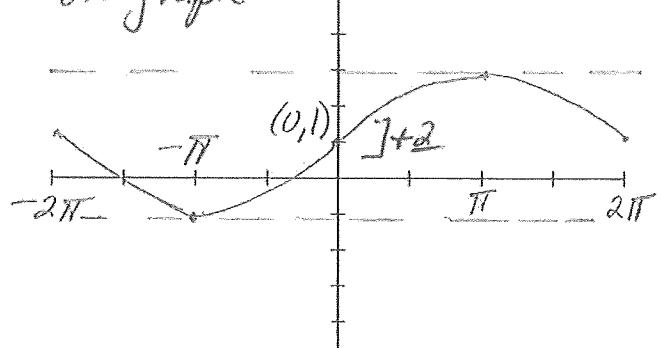
- b. For what values of x is $\tan(\arctan x) = x$?

For all $x \in \mathbb{R}$, or all real numbers $\boxed{+4}$

6. (16 points) For each of the following functions, sketch one period of the graph carefully.

8 a. $f(x) = 1 + 2 \sin(x/2)$
 $|A|=2$ period $= \frac{2\pi}{\frac{1}{2}} = 4\pi \boxed{+2}$
 vertical shift $\boxed{+2}$

- these may only be indicated
on graph



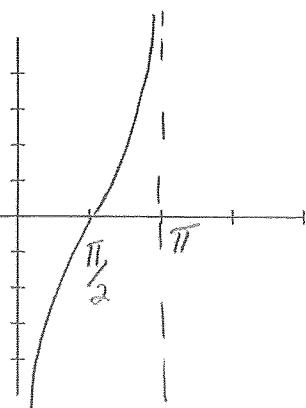
(student scale may
differ, yet be correct)

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

- shift graph of $\tan x$
to the right by $\frac{\pi}{2}$

4 pts for correct shape w/ asymptotes

4 pts for correct location with labels



7. (10 points) Find exact values of each of the following,

10pts

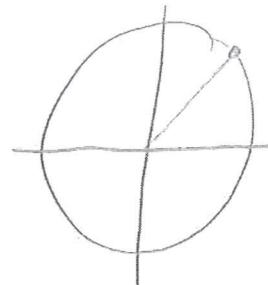
7. Find exact values.

yo

44

a. $\arctan(1)$

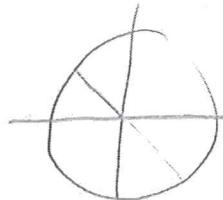
$= \frac{\pi}{4}$



16

b. $\sin^{-1}(\cos(3\pi/4))$

$$= \sin^{-1}\left(\frac{-\sqrt{2}}{2}\right) = \frac{-\pi}{4}$$

8. (10 points) If $\sin x = 4/9$ and $\cos x > 0$, find the values of the trigonometric functions below.

a. $\cos x$

$$= \frac{\sqrt{65}}{9}$$

+ 2

b. $\sec x$

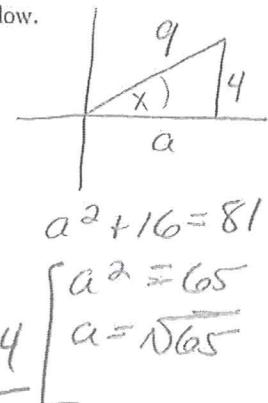
$$= \frac{9}{\sqrt{65}}$$

+ 2

c. $\tan x$

$$= \frac{4}{\sqrt{65}}$$

+ 2

9. In a predator/prey model the predator population is modeled by the function $y = 900 \cos 2t + 8000$, with t measured in years.

a. (4 points) What is the maximum population?

$$8000 + |A| = 8900 \quad \boxed{+ 4}$$

b. (4 points) Find the length of time between successive periods of maximum population.

$$\text{period} = \frac{2\pi}{2} = \pi \quad \boxed{\text{years}}$$

+ 2 + 2

26
26

- Anything on #3 for $\sin(x) = .7$?
or finding x?
- 5?
- 7 avg circle diagrams required
- Decimals on #8