

Eastern Oregon University Concurrent Enrollment/Credit by Proficiency Program

Math 112, Spring, 2014

Exam 1

name: \_\_\_\_\_

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

1. (12 points) For each angle below, change degrees to radians and radians to degrees:

a.  $5\pi/6$  rad

b.  $-300^\circ$

c.  $7\pi/2$  rad

d.  $765^\circ$

2. (6 points each) Find the exact value of each of the following. Include a circle sketch and reference triangle.

a.  $\tan(2\pi/3)$

b.  $\sin(-7\pi/6)$

c.  $\sec \frac{5\pi}{4}$

d.  $\cos(\sin^{-1} \frac{2}{3})$

e.  $\sin^{-1}(-\frac{1}{2})$

3. (10 points) A sector of a circle with a central angle measure of  $2\pi/3$  rad has area of  $5\text{m}^2$ . Find the radius of the circle.

4. (12 points) A ponderosa pine casts a shadow of 240 ft on level ground when the angle of elevation to the sun is  $24^\circ$ . How tall is the tree?

5. (12 points) If  $\cos \theta = 3/8$  and  $\sin \theta < 0$ , find the values of the other five elementary trigonometric functions at  $\theta$ . Draw a sketch with appropriate reference angle.

a.  $\sin \theta =$

b.  $\sec \theta =$

c.  $\csc \theta =$

d.  $\tan \theta =$

e.  $\cot \theta =$

6. (12 points) Solve each triangle below. Sketch appropriate triangles labeled such that side  $a$  is opposite angle  $A$ , side  $b$  opposite angle  $B$ , and side  $c$  opposite angle  $C$ .

a.  $a = 4$ ,  $c = 9$ ,  $B = 65^\circ$

b.  $A = 75^\circ$ ,  $B = 60^\circ$ ,  $c = 340$  miles

7. (12 points) A commercial jet leaves Kuala Lumpur and flies on a bearing of N  $30^\circ$  E for 90 minutes. The pilot then turns to fly on a bearing of N  $90^\circ$  W and flies on this bearing for 4 hours. If the plane is flying at a constant speed of 500 miles per hour, how far is it from Kuala Lumpur at this time?