

# Week in Review # 9

MATH 150

6.1 through 6.5

Drost-Fall 2002

1. Express in degree measure:

- a)  $\frac{7\pi}{6}$   
 b)  $\frac{-11\pi}{30}$

2. Find the central angle in radians given the radius is 12 inches and the intercepted arc is 32 inches.

3. A car is moving at 50 mph and the diameter of its wheels is 2.5 feet.

- a) Find the rotational speed of the wheels in rev/min.  
 b) Find the angular speed of the wheels in radians/min.

4. Find the other five trigonometric functions of  $\theta$  given  $\sin \theta = \frac{4}{5}$ , and  $\theta$  is in quadrant I.

5. Find the other five trigonometric functions of  $\theta$  given  $\cos \theta = \frac{1}{3}$ , and  $\theta$  is in quadrant IV.

6. Find the other five trigonometric functions of  $\theta$  given  $\tan \theta = \frac{2}{5}$  and  $\theta$  is in quadrant III.

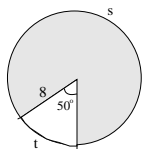
7. Find the length of the hypotenuse of a right triangle if the side opposite the  $42^\circ$  angle is 12 feet long.

8. An airplane is directly over an airport hangar. At a point 6,000 yards from the hangar the angle of elevation to the plane is  $18^\circ 25'$ . Find the height of the plane.

9. The measures of two angles in standard position are  $-30^\circ$  and  $330^\circ$ . Are the angles coterminal?

10. Find an angle between 0 and  $2\pi$  that is coterminal with  $\frac{-7\pi}{3}$ .

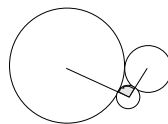
11. Find the length of the arc,  $s$ , in the figure below.



12. Find the shaded area above.

13. Three circles with radii 1, 2, and 3 ft are externally tangent to one another, as shown in the figure.

Find the area of the sector of the circle of radius 1 that is cut off by the line segments joining the center of that circle to the centers of the other two circles.

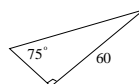


14. To measure the speed of a current, scientists place a paddle wheel in the stream and observe the rate at which it rotates. If the paddle wheel has radius 0.20 m and rotates at 100 rpm, find the speed of the current in m/s.

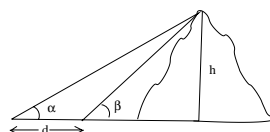
15. Evaluate without a calculator:

- a)  $\sin \frac{\pi}{6} + \cos \frac{\pi}{6}$   
 b)  $\cos 45^\circ \cdot \sec 45^\circ$   
 c)  $\sin 30^\circ \cos 60^\circ + \sin 60^\circ \cos 30^\circ$

16. Solve the right triangle shown below.



17. Find the height of the mountain,  $h$ , as a function of  $\alpha$  and  $\beta$ .



18. Find the height of the mountain if  $\alpha = 20^\circ$ ,  $\beta = 35^\circ$ , and  $d = 500$  ft.

ANSWERS:

1. a)  $210^\circ$ , b)  $-66^\circ$   
 2.  $2\sqrt{6}$  radians  
 3. a)  $560.2 \frac{rev}{min}$ ,  $3520 \frac{rad}{min}$   
 4.  $\cos \theta = \frac{3}{5}$ ,  $\tan \theta = \frac{4}{3}$ ,  $\csc \theta = \frac{5}{4}$ ,  
 $\sec \theta = \frac{5}{3}$ ,  $\cot \theta = \frac{3}{4}$   
 5.  $\sin \theta = -\frac{2}{3}\sqrt{2}$ ,  $\tan \theta = -2\sqrt{2}$ ,  $\csc \theta = -\frac{3}{4}\sqrt{2}$ ,  
 $\sec \theta = 3$ ,  $\cot \theta = -\frac{\sqrt{2}}{4}$   
 6.  $\sin \theta = -\frac{2}{29}\sqrt{29}$ ,  $\cos \theta = -\frac{5}{29}\sqrt{29}$ ,  
 $\csc \theta = -\frac{\sqrt{29}}{2}$ ,  $\sec \theta = -\frac{\sqrt{29}}{5}$ ,  $\cot \theta = \frac{5}{2}$   
 7.  $h = 17.9$  feet

8.  $h \approx 1997.87$  yards

9. yes

10.  $\frac{5\pi}{3}$

11.  $s \approx 43.28$  units

12.  $A \approx 173.14$  sq units

13.  $A \approx \frac{\pi}{4}$  sq units

14.  $v \approx 2.094$  meters/second

15a.  $\frac{1}{2} + \frac{\sqrt{3}}{2}$

15b. 1

15c. 1

16.  $15^\circ, 16.08, 62.12$

17.  $\frac{d \cdot \tan \alpha \tan \beta}{\tan \beta - \tan \alpha}$

18.  $h \approx 379$  feet