

Spring, 1999  
Peterson

MATH 124.

Homework 12.

**DUE: Friday, April 23.**

P1. The angle  $q$  is in standard position. Find exact values for  $\sin(q)$ ,  $\cos(q)$ ,  $\tan(q)$ ,  $\sec(q)$ ,  $\csc(q)$ , and  $\cot(q)$  in each case.

(1)  $\sin^2(q) = \frac{1}{4}$  and  $q$  is a first quadrant angle.

(2)  $\sin^2(q) = \frac{1}{4}$  and  $q$  is a third quadrant angle.

(3)  $\sin(q) = \frac{2}{5}$  and  $\cos(q) < 0$ .

(4) The point  $(-2, 6)$  is on the terminal side of  $q$ .

(5)  $\tan(q) = \frac{1}{2}$  and  $\sec(q) < 0$ .

(6)  $\sec(q) = \frac{3}{2}$  and  $\sin(q) < 0$ .

P2. Find exact answers for each of the following. Justify your answers.

(1)  $\cos\left(\frac{11}{3}p\right)$ .      (2)  $\sin(240^\circ)$ .      (3)  $\tan\left(-\frac{11}{4}p\right)$ .

P3. A right triangle has angles  $a$ ,  $b$ , and  $g$  with sides opposite of lengths  $a$ ,  $b$ , and  $c$ , respectively. In each case, solve the right triangle, finding 3-place decimal approximations for all unknown sides and angles.

(1)  $a = 42^\circ$ ,  $b = 90^\circ$ , and  $a = 5$ .

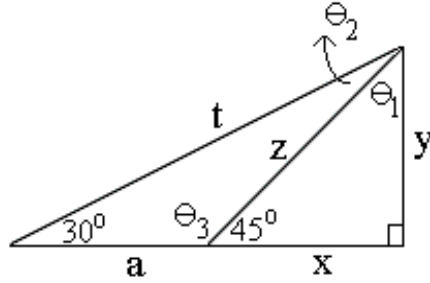
(2)  $a = 5$ ,  $b = 2$ , and  $g = 90^\circ$ .

(3)  $a = 5$ ,  $b = 2$ , and  $a = 90^\circ$ .

P4. An object travels around a spherical planet with a radius of 3000 miles at a constant altitude of 100 miles above the planet's surface. Suppose the object makes 1 revolution about the planet every ten hours. Find the linear speed of the object in miles per hour.

**CONTINUED ON THE BACK OF THIS SHEET.**

P5. Express  $x$ ,  $y$ ,  $z$  and  $t$  exactly in terms of  $a$  in the diagram



Also determine  $\theta_1$ ,  $\theta_2$ , and  $\theta_3$ .