The preceding examples enable us to complete the table that follows.

Table 2

x	$\cos x$	$\sin x$
0	1	0
$\frac{\pi}{6}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$
$\frac{\pi}{3}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$
$\frac{\pi}{2}$	0	1

[MT-05-10-28]

These are important function values for the student to remember.

Exercises 1.2

1. a. If x has coordinates (u, v), what coordinates does $-x$ have?
   b. $\cos x = u$. What is $\cos(-x)$?
   c. $\sin x = v$. What is $\sin(-x)$?

2. Find the following function values.
   a. $\cos\left[-\frac{\pi}{3}\right]$ b. $\cos\left[-\frac{\pi}{4}\right]$ c. $\cos\left[-\frac{\pi}{6}\right]$
   d. $\sin\left[-\frac{\pi}{3}\right]$ e. $\sin\left[-\frac{\pi}{4}\right]$ f. $\sin\left[-\frac{\pi}{6}\right]$

3. a. If x has coordinates (u, v), what coordinates does $x + \pi$ have?
   b. What is $\cos(x + \pi)$?
   c. What is $\sin(x + \pi)$?

4. Find the following function values.
   a. $\cos\frac{7\pi}{6}$ b. $\cos\frac{5\pi}{4}$ c. $\cos\frac{4\pi}{3}$
   d. $\sin\frac{7\pi}{6}$ e. $\sin\frac{5\pi}{4}$ f. $\sin\frac{4\pi}{3}$

5. a. If x has coordinates (u, v), what coordinates does $\pi - x$ have?
   b. What is $\cos(\pi - x)$?
   c. What is $\sin(\pi - x)$?

6. Find the following function values.
   a. $\cos\frac{3\pi}{4}$ b. $\cos\frac{2\pi}{3}$ c. $\cos\frac{5\pi}{6}$
   d. $\sin\frac{3\pi}{4}$ e. $\sin\frac{2\pi}{3}$ f. $\sin\frac{5\pi}{6}$

7. If x has coordinates (u, v), what coordinates does $x \pm 2\pi$ have?
   a. What is $\cos(x + 2\pi)$? b. What is $\sin(x + 2\pi)$?
   c. What is $\cos(x - 2\pi)$? d. What is $\sin(x - 2\pi)$?

8. Use the results of exercises 1–7 to find the following function values.
   a. $\cos\left[\frac{7\pi}{4}\right]$ b. $\cos\left[-\frac{7\pi}{6}\right]$ c. $\cos\left[\frac{10\pi}{3}\right]$
   d. $\sin\left[-\frac{5\pi}{4}\right]$ e. $\sin\left[\frac{11\pi}{6}\right]$ f. $\sin\left[-\frac{4\pi}{3}\right]$
   g. $\sin\left[-\frac{5\pi}{6}\right]$ h. $\sin\left[\frac{8\pi}{3}\right]$ i. $\sin\left[-\frac{9\pi}{4}\right]$
   j. $\cos\left[\frac{5\pi}{6}\right]$ k. $\cos\left[-\frac{11\pi}{6}\right]$ l. $\cos\left[\frac{13\pi}{4}\right]$

9. x is in the second quadrant, $\cos x = -\frac{15}{17}$. Find $\sin x$.
10. x is in the fourth quadrant, $\cos x = \frac{3}{5}$. Find $\sin x$.
11. x is in the fourth quadrant, $\sin x = -\frac{1}{3}$. Find $\cos x$.
12. x is in the second quadrant, $\sin x = \frac{\sqrt{5}}{5}$. Find $\cos x$.
13. z is in the first quadrant, $\sin z = \frac{8}{17}$. Find $\cos z$.
14. z is in the third quadrant, $\sin z = -\frac{3}{4}$. Find $\cos z$.
15. y is in the third quadrant, $\cos y = -\frac{2}{5}$. Find $\sin y$.
16. t is in the first quadrant, $\cos t = \frac{5}{13}$. Find $\sin t$.
17. w is in the fourth quadrant, $\sin w = -\frac{2}{3}$. Find $\cos w$.
18. θ is in the second quadrant, $\cos\theta = -\frac{2}{7}$. Find $\sin\theta$.

Exercises 1.1

1. In which quadrant does the given point lie?
   a. $\frac{3\pi}{4}$ b. $-\frac{9\pi}{7}$ c. $\frac{11\pi}{3}$ d. $\frac{7\pi}{6}$
   e. $-\frac{7\pi}{4}$ f. $-\frac{7\pi}{6}$ g. $-\frac{\pi}{3}$ h. $\frac{13\pi}{6}$

2. Give four other real numbers which correspond to the same point on the unit circle as the given number.
   a. $\frac{\pi}{3}$ b. $\frac{\pi}{6}$ c. $\frac{3\pi}{4}$ d. $\frac{4\pi}{3}$ e. $\frac{5\pi}{6}$ f. $\frac{\pi}{4}$

Name a point which is symmetric to the given point with respect to (a) the u-axis; (b) the v-axis; (c) the origin.

3. $\frac{\pi}{6}$ 4. $\frac{\pi}{3}$ 5. $\frac{3\pi}{4}$ 6. $\frac{5\pi}{8}$
7. $\frac{3\pi}{7}$ 8. $\frac{5\pi}{9}$ 9. $\frac{\pi}{12}$ 10. $\frac{\pi}{10}$

Chapter 1

Exercises 1.1

1. a. II c. IV e. I g. IV
2. a. $\frac{7\pi}{3}\ \frac{13\pi}{3}\ -\frac{5\pi}{3}\ -\frac{11\pi}{3}$ c. $\frac{11\pi}{4}\ \frac{19\pi}{4}\ -\frac{5\pi}{4}\ -\frac{13\pi}{4}$
   e. $\frac{7\pi}{6}\ \frac{19\pi}{6}\ -\frac{17\pi}{6}\ -\frac{29\pi}{6}$
3. a. $-\frac{\pi}{6}$ b. $\frac{5\pi}{6}$ c. $\frac{7\pi}{6}$
5. a. $-\frac{3\pi}{4}$ b. $\frac{\pi}{4}$ c. $\frac{7\pi}{4}$
7. a. $\frac{3\pi}{7}$ b. $\frac{4\pi}{7}$ c. $\frac{10\pi}{7}$
9. a. $\frac{\pi}{12}$ b. $-\frac{11\pi}{12}$ c. $\frac{11\pi}{12}$

Exercises 1.2

1. a. $(u, -v)$ b. u c. $-v$
2. a. $\frac{1}{2}$ c. $\frac{\sqrt{3}}{2}$ e. $-\frac{\sqrt{2}}{2}$
3. a. $(-u, -v)$ b. $-u$ c. $-v$
4. a. $-\frac{\sqrt{3}}{2}$ c. $-\frac{1}{2}$ e. $-\frac{\sqrt{2}}{2}$
5. a. $(-u, v)$ b. $-u$ c. v
6. a. $-\frac{\sqrt{2}}{2}$ c. $-\frac{\sqrt{3}}{2}$ e. $\frac{\sqrt{3}}{2}$

9. $\frac{8}{17}$ 11. $\frac{2\sqrt{2}}{3}$ 13. $\frac{15}{17}$ 15. $-\frac{\sqrt{21}}{5}$ 17. $\frac{\sqrt{5}}{3}$