## 5.4 Trigonometric Functions of Special Angles

1. Find the values of the three trigonometric functions for an angle in standard position that measures 180°.

$\sin 180 = 0$
$\cos 180 = -1$
$\tan 180 = 0/-1 = 0$

Study the Unit Circle.
Remember $x = \cos\theta$
$y = \sin\theta$
$y/x = \tan\theta$.

2. Find sin 30°, cos 30°, and tan 30°.

$\sin 30 = 1/2$
$\cos 30 = \sqrt{3}/2$
$\tan 30 = \sqrt{3}/3$

3. Measure of Special Angles:

| $\theta$ (in radians) | 0 | $\frac{\pi}{6}$ | $\frac{\pi}{4}$ | $\frac{\pi}{3}$ | $\frac{\pi}{2}$ | $\frac{2\pi}{3}$ | $\frac{3\pi}{4}$ | $\frac{5\pi}{6}$ | $\pi$ |
|---|---|---|---|---|---|---|---|---|---|
| $\theta$ (in degrees) | 0 | 30 | 45 | 60 | 90 | 120 | 135 | 150 | 180 |
| $\cos\theta$ | 1 | $\sqrt{3}/2$ | $\sqrt{2}/2$ | $1/2$ | 0 | $-1/2$ | $-\sqrt{2}/2$ | $-\sqrt{3}/2$ | $-1$ |
| $\sin\theta$ | 0 | $1/2$ | $\sqrt{2}/2$ | $\sqrt{3}/2$ | 1 | $\sqrt{3}/2$ | $\sqrt{2}/2$ | $1/2$ | 0 |

All $\pi/6$ have a 30° reference angle
$\pi/4$ have a 45° reference angle.

| $\theta$ (in radians) | $\frac{7\pi}{6}$ | $\frac{5\pi}{4}$ | $\frac{4\pi}{3}$ | $\frac{3\pi}{2}$ | $\frac{5\pi}{3}$ | $\frac{7\pi}{4}$ | $\frac{11\pi}{6}$ | $2\pi$ |
|---|---|---|---|---|---|---|---|---|
| $\theta$ (in degrees) | 210 | 225 | 240 | 270 | 300 | 315 | 330 | 360 |
| $\cos\theta$ | $-\sqrt{3}/2$ | $-\sqrt{2}/2$ | $-1/2$ | 0 | $1/2$ | $\sqrt{2}/2$ | $\sqrt{3}/2$ | 1 |
| $\sin\theta$ | $-1/2$ | $-\sqrt{2}/2$ | $-\sqrt{3}/2$ | $-1$ | $-\sqrt{3}/2$ | $-\sqrt{2}/2$ | $-1/2$ | 0 |

Remember what Quadrant you are in!

1. Find each value.

a. $\sin\frac{7\pi}{2} = -1$ coterminal $3\pi/2$

b. $\tan -\frac{8\pi}{3} = -1/2$ coterminal $4\pi/3$

c. $\cos -\frac{13\pi}{4} = -\sqrt{2}/2$ coterminal $3\pi/4$

2. Find each value. (CALC)

b. $\tan -\frac{9\pi}{7} = -1.25$

b. $\sin 321° = -.0109$

c. $\cos 2.1\pi = .951$

Use the proper mode

HW page 267 #16-18, 22,23, 25, 28, 30, 33-35; Practice 5.4 Worksheet