Math 29
PAL Worksheet 20

1. Which of the following give measures of coterminal angles?

   a. $\frac{7\pi}{13}$ b. $-\frac{20\pi}{13}$ c. $-\frac{35\pi}{13}$

   d. $\frac{6\pi}{13}$ e. $\frac{22\pi}{13}$ f. $-\frac{19\pi}{13}$

   g. $-\frac{30\pi}{13}$ h. $\frac{32\pi}{13}$ i. $-\frac{9\pi}{13}$

2. Suppose that $0 \leq \alpha \leq \pi$.

   a. Find an expression for an angle between 2π and 3π that is coterminal with α.

   b. Find an expression for an angle between $-\pi$ and -2π that is coterminal with α.

   c. Find an expression for an angle between 4π and 5π that is coterminal with α.

3. Suppose that $-\pi \leq \beta \leq 0$,

   a. Find an expression for an angle between 3π and 4π that is coterminal with β.

   b. Find an expression for an angle between -2π and -3π that is coterminal with β.

   c. Find an expression for an angle between 5π and 6π that is coterminal with β.

4. Find an angle between 0 and 2π whose terminal side intersects the unit circle at:

   a. $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ b. $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ c. $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ d. $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

   e. $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ f. $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ g. $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ h. $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

   i. $\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ j. $\left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ k. $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$ l. $\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$

5. Find the exact value of each of the following without the aid of a calculator.
   a. $\cos\left(\frac{17\pi}{4}\right)$
   b. $\sin\left(-\frac{19\pi}{4}\right)$
   c. $\tan\left(\frac{29}{3}\pi\right)$

6. Find *all* the values of x which solve each equation:
   a. $\cos x = \dfrac{\sqrt{2}}{2}$
   b. $\sin x = -\dfrac{\sqrt{3}}{2}$
   c. $\sin x = 0$
   d. $\tan x = -1$