Math Xb Spring 2004
Worksheet: Right-Triangle Trigonometry
March 5, 2004

1. Find exact values for each of the following. Use your calculator only to check your answers.

   (a) $\sin\left(-\frac{\pi}{4}\right) = -\frac{1}{\sqrt{2}}$

   (b) $\cos\left(\frac{2\pi}{3}\right) = -1/2$

   (c) $\tan\left(\frac{11\pi}{6}\right) = -\frac{1}{\sqrt{3}}$

   (d) $\csc\left(-\frac{5\pi}{6}\right) = -2$

   (e) $\sec\left(\frac{11\pi}{4}\right) = -\sqrt{2}$

   (f) $\cot\left(-\frac{3\pi}{2}\right) = 0$

   (g) $\sin\left(\frac{13\pi}{4}\right) = -\frac{1}{\sqrt{2}}$

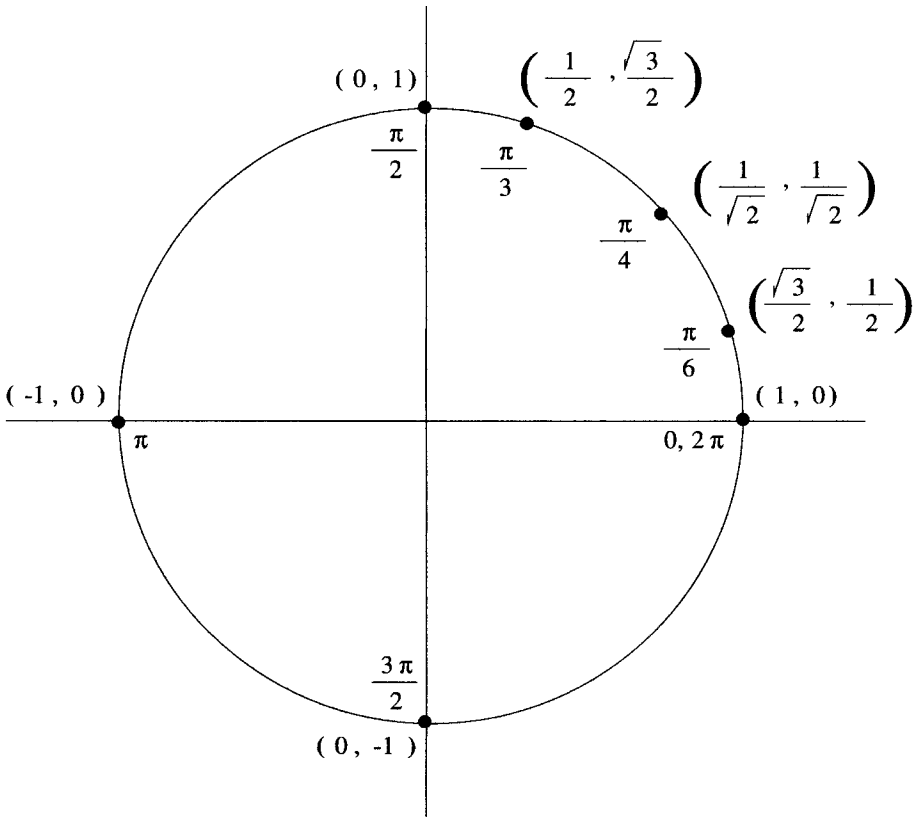
   (h) $\cos\left(-\frac{7\pi}{3}\right) = 1/2$

   (i) $\tan\left(\frac{9\pi}{4}\right) = 1$

   (j) $\csc\left(-\frac{5\pi}{3}\right) = 2/\sqrt{3}$

   (k) $\sec\left(\frac{\pi}{2}\right) =$ undefined

   (l) $\cot\left(\frac{\pi}{6}\right) = \sqrt{3}$



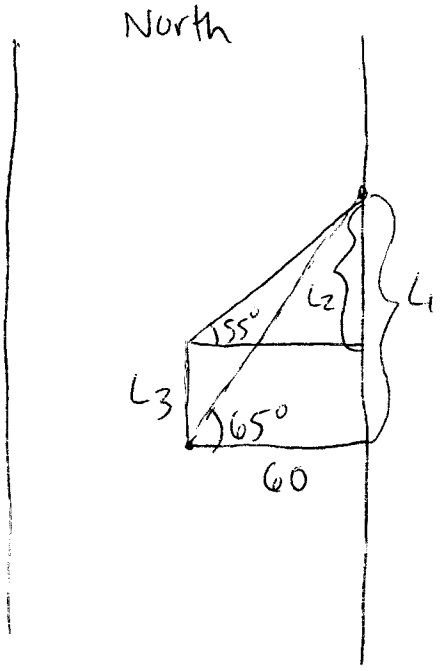
2. (a) For what values of x is $\tan x = \frac{1}{\sqrt{3}}$?

$X = \frac{\pi}{6}, \frac{7\pi}{6}, \ldots \frac{\pi}{6} + n\pi$ where n an integer

(b) For what values of x is $\tan x = -\frac{1}{\sqrt{3}}$?

$X = \frac{5\pi}{6} + n\pi$, n an integer

3. A boat is sailing north on the Nile at a steady pace. The river is straight and the boat maintains a distance of 60 feet from the eastern shoreline. At noon, the captain spots a temple on the eastern shore at a bearing of 25° degrees east of north. Fifteen minutes later the bearing is 35° degrees east of north. How fast is the boat going?



$\tan 65° = \frac{L_1}{60} \Rightarrow L_1 = 128.67$

$\tan 55° = \frac{L_2}{60} \Rightarrow L_2 = 85.69$

$L_1 - L_2 = L_3 = 43$ feet

So traveling 43 feet/15 mins

$\Rightarrow$ 172 feet/hr