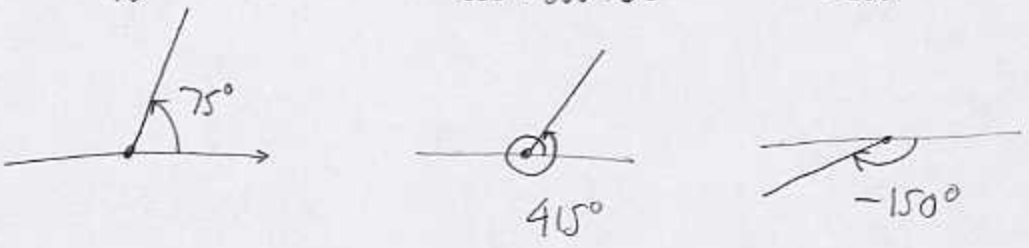
Spring '06/MAT 145/Worksheet 1 **Name:** Solution *Show all your work.*

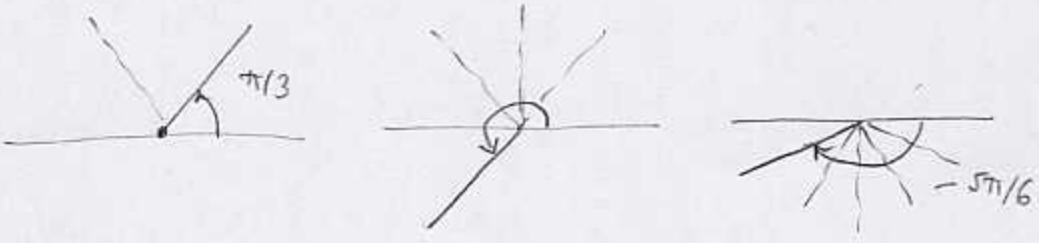
1. (3pts) Sketch angles in standard position with indicated degree angle measure.

$75°$ $415° = 360° + 55°$ $-150°$

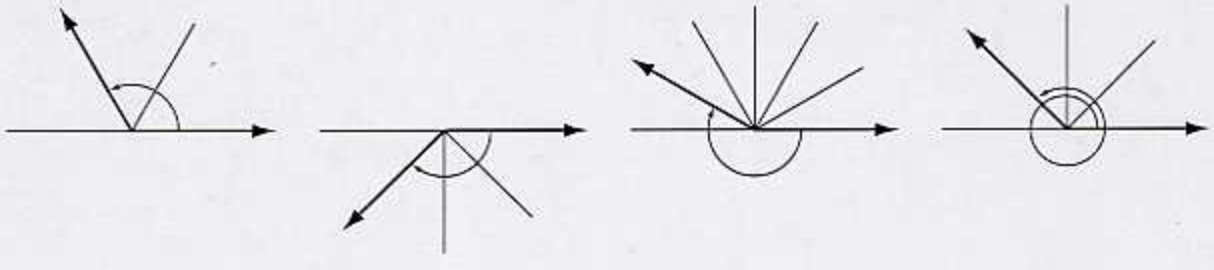


2. (3pts) Sketch angles in standard position with indicated radian angle measure.

$\frac{\pi}{3}$ $\frac{5\pi}{4}$ $-\frac{5\pi}{6}$



3. (8pts) Indicate both the radian and degree measure under the following angles. (Use equally-spaced auxiliary lines to help you determine what the angles are.)



$\frac{2\pi}{3}$ $-\frac{3\pi}{4}$ $-\frac{7\pi}{6}$ $2\pi + \frac{3\pi}{4} = \frac{11\pi}{4}$

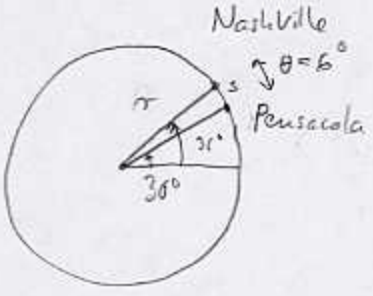
$120°$ $-135°$ $-210°$ $360° + 135° = 495°$

4. (5pts) Convert the angle 63.28° to
a) $D°M'S''$ form (show work!)
b) radians.

a) $62.38° = 62° + 0.28 \cdot 60' = 62°\,16.8' = 62°\,16' + 0.8 \cdot 60'' = 62°\,16'\,48''$

b) $62.38° \cdot \frac{\pi}{180°} = 1.0887$ radians

5. (5pts) Nashville, TN (36° north latitude) is almost directly north of Pensacola, FL (30° north latitude). Find the distance between those cities, assuming that the radius of Earth is 3960 miles.



$s = r\theta = 3960 \cdot 6° \cdot \frac{\pi}{180°} = \frac{3960\pi}{30}$

$= 414.69$ miles

6. (6pts) A car whose tires have radius 22in is traveling at 45mph. How many revolutions per minute do the wheels make?

$v = \omega r$ so $\omega = \frac{v}{r} = \frac{45 \text{ mph}}{22 \text{ in}} = \frac{45 \cdot 5280 \cdot 12 \text{ in/hr}}{22 \text{ in}}$

$= \frac{45 \cdot 5280 \cdot 12 \cdot \frac{1}{60} \text{ in/min}}{22 \text{ in}} = 2160$ radians/min

2160 rad/min $= \frac{2160}{2\pi}$ rpm $= 343.77$ rpm