

### Additional Problem Assignment 4

1. For each angle find the reference angle in the first quadrant (positive acute angle).

(a)  $\frac{4\pi}{7}$

(b)  $\frac{9\pi}{4}$

(c)  $-\frac{3\pi}{5}$

(d)  $-\frac{13\pi}{6}$

2. Given that  $\sin\left(\frac{5\pi}{12}\right) = \frac{\sqrt{6} + \sqrt{2}}{4}$  and  $\cos\left(\frac{5\pi}{12}\right) = \frac{\sqrt{6} - \sqrt{2}}{4}$ . Find the exact value (i.e. don't use your calculators) of

(a)  $\sin\left(\frac{7\pi}{12}\right)$

(b)  $\cos\left(\frac{13\pi}{12}\right)$

(c)  $\sin\left(-\frac{5\pi}{12}\right)$

(d)  $\cos\left(-\frac{23\pi}{12}\right)$