## 5.2:

2. a) $\cos(12\pi) = \cos(2\pi) = 1.$

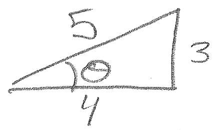
b) $\sin\left(\frac{5\pi}{2}\right) = \sin\left(\frac{\pi}{2} + \frac{4\pi}{2}\right)$
$= \sin\left(\frac{\pi}{2} + 2\pi\right)$
$= \sin(\pi/2)$
$= 1.$

c) $\sin\left(-\frac{9\pi}{2}\right) = \sin\left(-\frac{9\pi}{2} + \frac{12\pi}{2}\right)$
$= \sin\left(\frac{3\pi}{2}\right)$
$= -1$

d) $\cos(101\pi) = \cos(\pi + 100\pi)$
$= \cos(\pi)$
$= -1$

4. What is $\cos(\theta + \pi)$ in terms of $\cos(\theta)$?

$\cos(\theta + \pi) = -\cos(\theta)$

6. 


a) calculate $\sin(\theta)$ and $\cos(\theta)$

$\sin(\theta) = 3/5$
$\cos(\theta) = 4/5.$

b) calculate $\sin^2(\theta) + \cos^2(\theta)$

$$\left(\frac{3}{5}\right)^2 + \left(\frac{4}{5}\right)^2 = \frac{9}{25} + \frac{16}{25} = \frac{25}{25} = 1.$$

## 5.3

2. $\sin(7\pi/4) = \sin\left(7\pi/4 - \frac{8\pi}{4}\right) = \sin(-\pi/4) = -\sin(\pi/4) = -\frac{\sqrt{2}}{2}.$

4. $\cos(-3\pi/4) = \cos(3\pi/4) = -\frac{\sqrt{2}}{2}.$

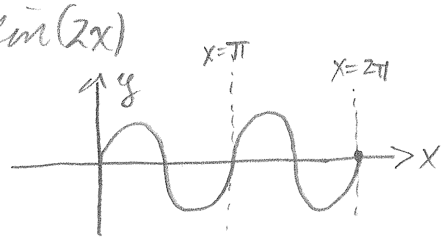
8. $\cos\left(\frac{13\pi}{6}\right) = \cos\left(\frac{12\pi}{6} + \pi/6\right) = \cos(\pi/6 + 2\pi) = \cos(\pi/6) = \frac{\sqrt{3}}{2}.$

12. $\sin\left(\frac{29\pi}{6}\right) = \sin\left(\frac{24\pi}{6} + \frac{5\pi}{6}\right) = \sin\left(4\pi + \frac{5\pi}{6}\right) = \sin(5\pi/6) = 1/2$

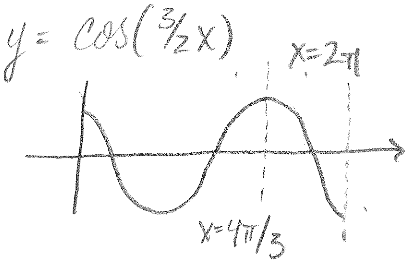
## 5.4

4. Graph the following functions over the interval $(0, 2\pi)$

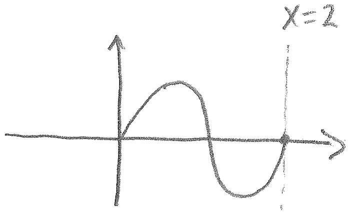
a) $y = \sin(2x)$




b) $y = \cos(3/2\, x)$



c) $y = \sin(\pi x)$




If you were to extend this to $[0, 2\pi]$, there would be $\pi$ periods of $\sin(\pi x)$ (roughly 3).

10. Graph $y = 3\sin(2x) - 1$, find its amplitude, period, and frequency.

The amplitude is 3, the period is $\frac{2\pi}{2} = \pi$, and the frequency is 2 periods (over the interval $2\pi$).