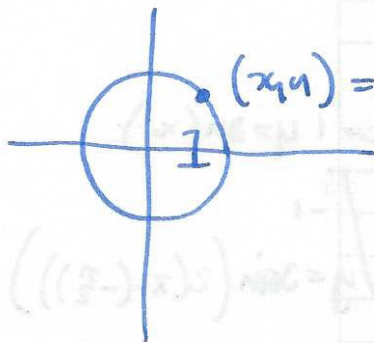
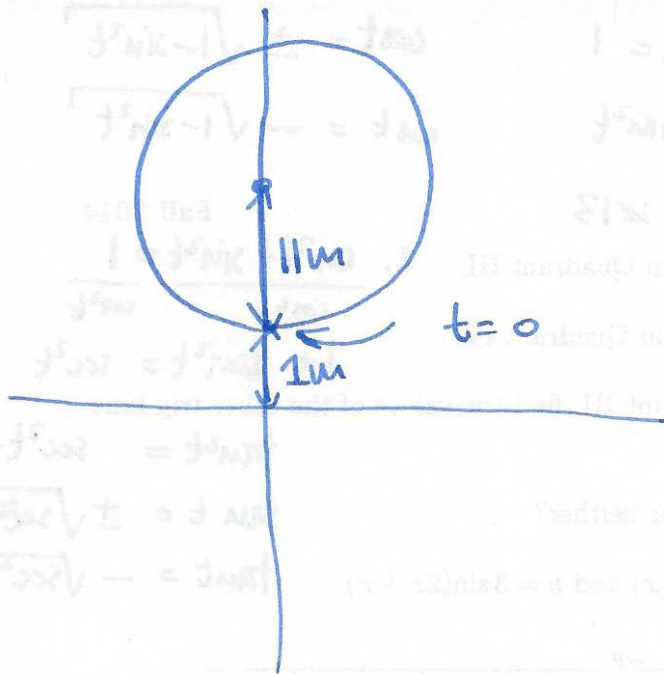


Q3



radius 11 : $(11 \cos(t), 11 \sin(t))$.

one revolution every 20 secs.

\Rightarrow period = 20 = $\frac{2\pi}{k}$

$20k = 2\pi$

$k = \frac{\pi}{10}$

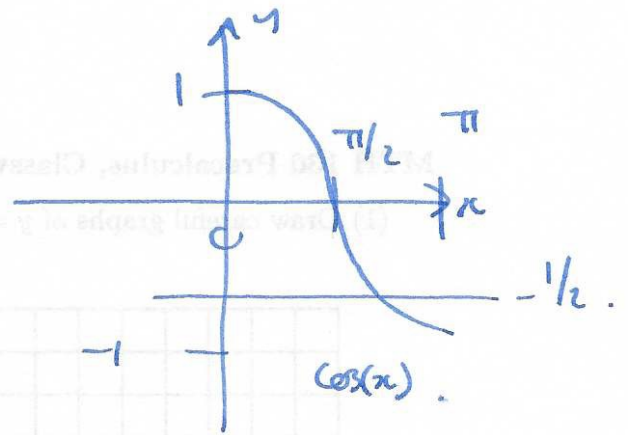
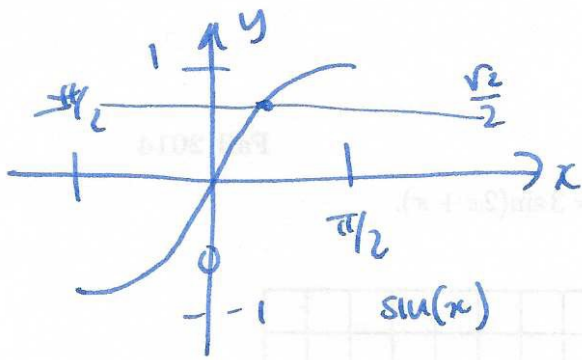
phase shift: want to start at $(0, -11)$ i.e. $b = -\frac{\pi}{2}$.

finally: add 12 to y-coordinate:

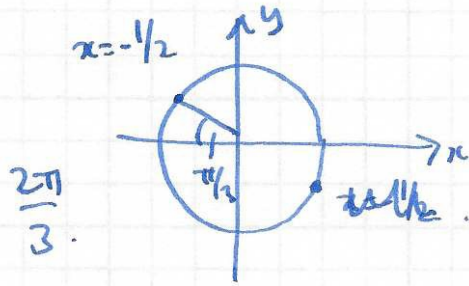
$x = 11 \cos\left(\frac{\pi}{10}\left(t + \frac{\pi}{2}\right)\right)$

$y = 11 \sin\left(\frac{\pi}{10}\left(t + \frac{\pi}{2}\right)\right) + 12$

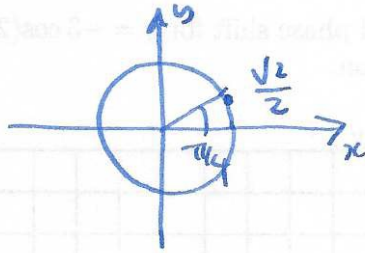
Q4



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

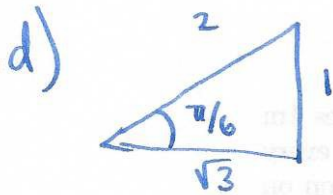


b) $\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$
 $= \frac{\pi}{4}$



c) $\tan^{-1}(1) = \frac{\pi}{4}$

$\sin\left(\frac{\pi}{6}\right) = \frac{1}{2}$ $\sin^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{6}$



e) $\cos\left(-\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$ $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{6}$

f) $\tan^{-1}\left(\tan\left(\frac{7\pi}{6}\right)\right) = \tan^{-1}\left(\tan\left(\frac{\pi}{6}\right)\right) = \frac{\pi}{6}$