

$$y = A \cos(kt - c) + h$$

$$\max = 13.75$$

$$\min = 10.53$$

A is neg

$$\text{Per} = 12 = \frac{2\pi}{k}$$

$$\text{Ampl} = \frac{13.75 - 10.53}{2} = 1.61$$

$$\text{V.S.} = \frac{13.75 + 10.53}{2} = 12.14$$

$$k = \frac{2\pi}{12}$$

$$k = \frac{\pi}{6}$$

$$y = -1.61 \cos\left(\frac{\pi}{6}t - c\right) + 12.14$$

$$13.75 = -1.61 \cos\left(\frac{\pi}{6}(6) - c\right) + 12.14$$

$$\frac{1.61}{-1.61} = \frac{-1.61 \cos(\pi - c)}{-1.61}$$

$$-1 = \cos(\pi - c)$$

$$\cos^{-1}(-1) = \pi - c$$

$$\cos^{-1}(-1) - \pi = -c$$

$$0 = -c$$

a. $y = -1.61 \cos\left(\frac{\pi}{6}t\right) + 12.14$

$$y = 1.61 \sin\left(\frac{\pi}{6}t - 1.66\right) + 12.14$$

b. Sept. 30 $\Rightarrow t = 9.5$

$$y = -1.61 \cos\left(\frac{\pi}{6}(9.5)\right) + 12.14$$

$$y = 11.72 \text{ hrs}$$

$$t = 9.5$$

$$y = 11.86 \text{ hrs}$$

p. 391

7-12