

HW #32 p.364

20. a.  $y = 56 \sin(x + .5) + 144$  b.  $\approx 168$

OR  
amplitude  $\rightarrow a = \frac{1}{2}(200 - 87) = 56.5$

vertical shift  $d = \frac{1}{2}(200 + 87) = 143.5$

Period  $2(4 - 1) = 2(3) = 6$

$$\frac{2\pi}{B} = 6 \quad B = \frac{2\pi}{6} = \frac{\pi}{3}$$

Phase shift  $\frac{-C}{\frac{\pi}{3}} = 1 \quad C = -\frac{\pi}{3}$

a.  $y = 56.5 \cos\left(\frac{\pi}{3}x - \frac{\pi}{3}\right) + 143.5$   
b.  $\approx 115$  reservations

21. amplitude  $a = \frac{1}{2}(12.95 - 2.02) = \boxed{5.465}$

period:  $2(10:55 - 4:25) = 2(6.5) = \boxed{13}$

phase shift  $4:25 = 4.417 = \boxed{4.417}$

vertical shift  $\frac{1}{2}(12.95 + 2.02) = \boxed{7.485}$

b.  $y = 5.5 \cos\left(\frac{\pi}{6.5}x - \frac{\pi}{1.47}\right) + 7.5$

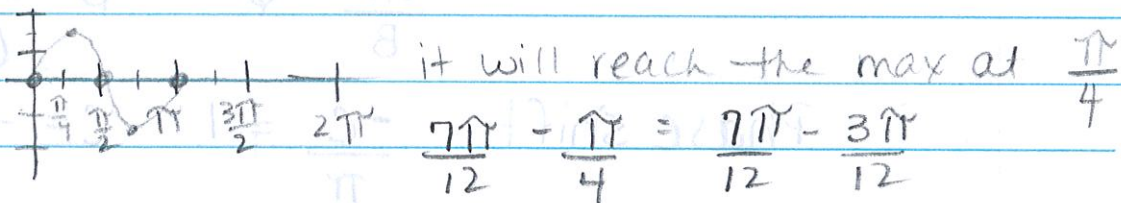
c. 7.28

22. a. amplitude 22.5  
 period 12  
 phase 7  
 vertical 51.5

b.  $y = 22.5 \cos\left(\frac{\pi}{6}t - \frac{7\pi}{6}\right) + 51.5$

c. 71° F

29. 1) period  $\frac{2\pi}{B} = \frac{2\pi}{2} = \pi$ .



it will reach the max at  $\frac{\pi}{4}$

$$\frac{7\pi}{12} - \frac{\pi}{4} = \frac{7\pi}{12} - \frac{3\pi}{12}$$

phase shift =  $\frac{4\pi}{12} = \frac{\pi}{3}$

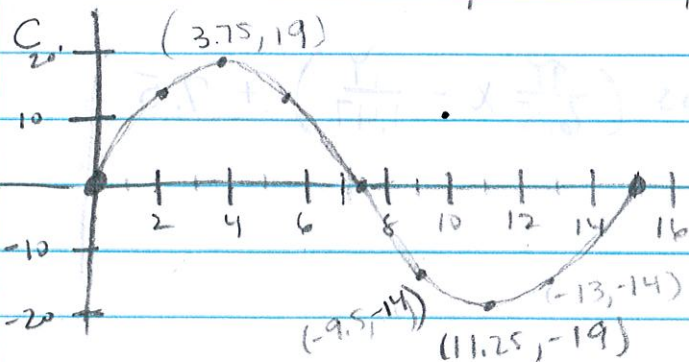
$$\frac{-C}{2} = \frac{\pi}{3}$$

$$C = -\frac{2\pi}{3}$$

$$y = 1.5 \sin\left(2t - \frac{2\pi}{3}\right)$$

30. a.  $2(3.75) = 7.5$  seconds

b. half of a cycle → period = 15 seconds



$$d. y = 19 \sin \frac{2\pi}{15}t$$

period =  $\frac{2\pi}{B}$

$$15 = \frac{2\pi}{B}$$

$$B = \frac{2\pi}{15}$$

31.  $y = 3 \sin(2x)$

32.  $y = \frac{1}{2} \cos\left(\frac{x}{3}\right)$

33.  $y = 2 \cos(4x) + 1$

34.  $y = 4 \sin\left(\frac{x}{2}\right) - 2$

35.  $y = 5 \cos(2x)$

$$\pi = \frac{2\pi}{B}$$

$$\frac{5}{2} = 5 \cos\left(\frac{2\pi}{6}\right) + d$$

$$B = \frac{2\pi}{\pi}$$

$$\frac{5}{2} = 5 \cos\left(\frac{\pi}{3}\right) + d$$

$$\boxed{B = 2}$$

$$\frac{5}{2} = 5\left(\frac{1}{2}\right) + d$$

$$\frac{5}{2} = \frac{5}{2} + d$$

$$d = 0$$