

SELECT SOLUTIONS

**Homework Title: Modeling Sinusoidal Data III**

1a) 8 revs per minute  $\rightarrow$  period =  $60/8 = 7.5$  seconds  $\rightarrow B = \frac{4\pi}{15}$ , Max = 65 ft, Min = 15 ft, Amp = 25,  
 Axis:  $y = 40$ , Equation:  $h = 25 \cos\left(\frac{4\pi}{15}(t - 1.5)\right) + 40$

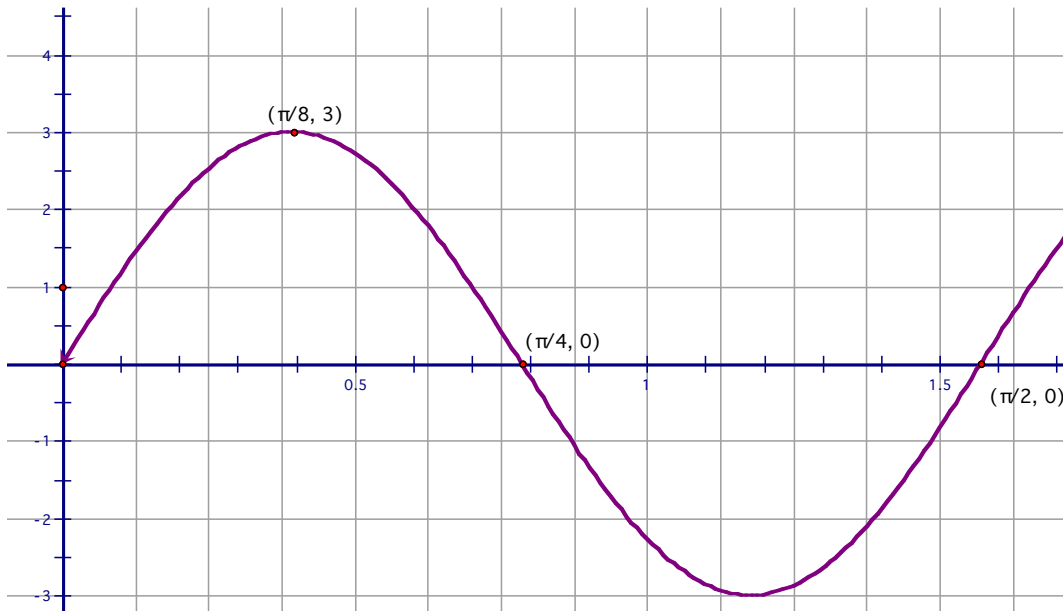
1c) Period = 15 seconds  $\rightarrow B = \underline{\hspace{2cm}}$

Since the blade is now going half as fast, instead of reaching the top at 1.5 seconds, the blade now reaches the top after 3 seconds.

Equation:  $h = \underline{\hspace{4cm}}$

2b) Rewritten with extra parentheses the equation is  $y = 3 \sin\left(4\left(x - \frac{\pi}{2}\right)\right)$

Period =  $\frac{\pi}{2}$ , so the horizontal shift, C, is one full period. Therefore, the graph won't look like it has a shift at all.



2d) Equation:  $y = 12 \sin\left(\frac{\pi}{16}t\right) + 6$  or  
 $y = -12 \cos\left(\frac{\pi}{16}(t + 8)\right) + 6$  or  
 $y = 12 \cos\left(\frac{\pi}{16}(t - 8)\right) + 6$  or  
 $y = -12 \sin\left(\frac{\pi}{16}(t - 16)\right) + 6$