AFM Unit 2 Graphing Trig Review

**1.** The temperature in an office is controlled by an electronic thermostat. The temperatures vary according to the sinusoidal function:

$$y = 19 + 6\sin\left(\frac{\pi}{12}(x-11)\right)$$

where $y$ is the temperature (°C) and $x$ is the time in hours past midnight.

**a.)** What is the temperature in the office at 9 A.M. when employees come to work? $y = 19 + 6\sin\left(\frac{\pi}{2}(9-11)\right) \rightarrow y = 16°C$

**b.)** What are the maximum and minimum temperatures in the office?

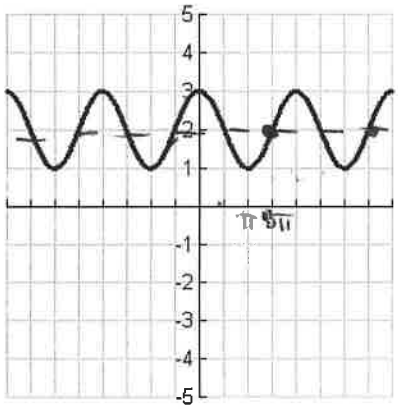
Max $19+6$ $25°C$

Min $19-6$ $13°C$

2. **OCEAN TIDES** The height of the water in a bay varies sinusoidally over time. On a certain day off the coast of Maine, a high tide of 10 feet occurred at 5:00 A.M. and a low tide of 2 feet occurred at 1:00 P.M. Write a model for the height $h$ (in feet) of the water as a function of time $t$ (in hours since midnight).

See work $y = 4\cos\frac{\pi}{8}(x-5) + 6$

3. State the period, amplitude, vertical and phase shift, then write the equation of the graph in terms of sine. Each line on x-axis is $\frac{\pi}{2}$.



Amp: 1 V.S. up 2 P.S R+ $\frac{3\pi}{2}$ left $\frac{\pi}{2}$

Period: $2\pi$

$y = \sin(x - \frac{3\pi}{2}) + 2$

or

$y = \sin(x + \frac{\pi}{2}) + 2$

4. Determine the graph of $y = 4\sin\frac{1}{3}x$.

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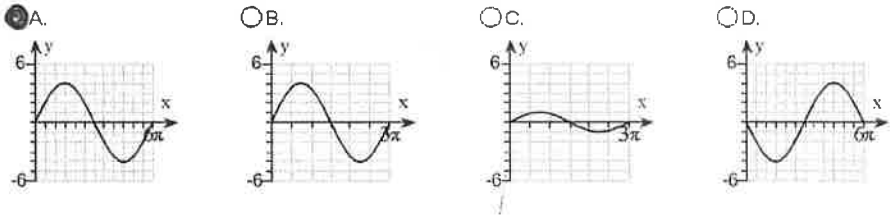



→ period $\frac{2\pi}{b}$ $\frac{2\pi}{1/3}$ $6\pi$

5. Determine the Amplitude, Period, Phase and vertical shift of the equations:

a) $y = 3\sin\frac{2\pi}{3}(x-\pi) + 2$

Amp: 3 Period $= \frac{2\pi}{\frac{2\pi}{3}} = 3$

P.S. R+ $\pi$ V.S. up 2

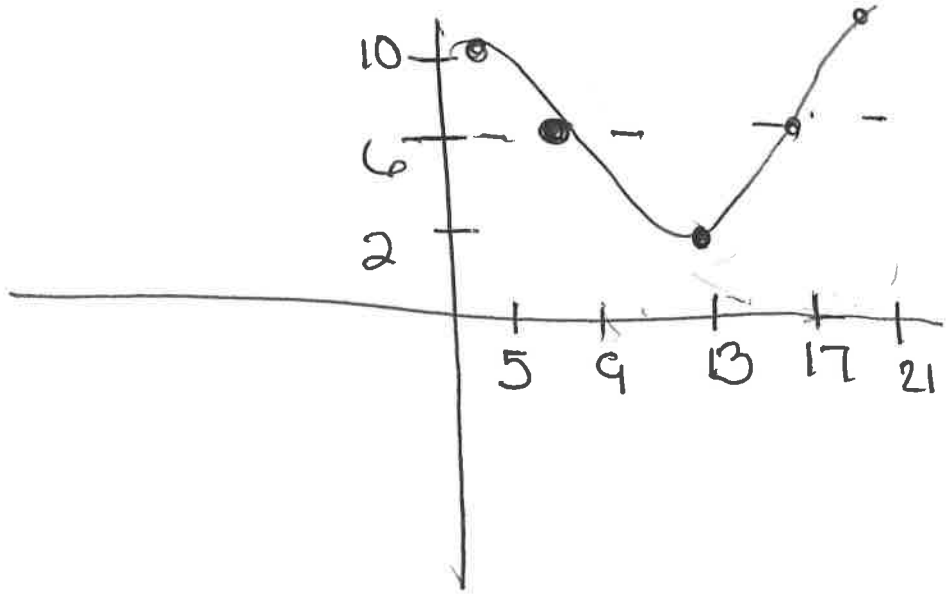
b) $y = -2\cos 3\left(x + \frac{\pi}{2}\right) - 1$

Amp: 2 Period: $\frac{2\pi}{3}$

P.S. left $\frac{\pi}{2}$ VS: down 1

② 5AM, 10ft

1PM (13) 2 ft




$$y = 4\cos\frac{2\pi}{16}(x-5)+6$$

$$y = 4\cos\frac{\pi}{8}(x-5)+6$$