Construct a sinusoid with the given amplitude and period that goes through the given point. Sine

A) Amp: 6, period 8π, point (0, 0)

$A = 6$

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

$B = \frac{2\pi}{Per} = \frac{2\pi}{8\pi} = \frac{1}{4}$

$y = A \sin B(x-c) + D$

$y = 6 \sin \frac{1}{4}x$

B) Amp: 5.5, period $\frac{\pi}{6}$, point (4, 0)

$A = 5.5$

$B = \frac{2\pi}{\frac{\pi}{6}}$ $\quad \frac{2\pi}{1} \cdot \frac{6}{\pi}$

$= 12$

P.S. Right 4

$y = 5.5 \sin 12(x-4)$

C) Amp: 8, period 10π, point (0, 0)

$y = 8 \sin \frac{1}{5}x$

$B = \frac{2\pi}{per} = \frac{2\pi}{10\pi} = \frac{1}{5}$

D) Amp: 4.5, period $\frac{\pi}{10}$, point (6, 0)

$y = 4.5 \sin 20(x-6)$

Calculating the Ebb and Flow of Tides for Maui

$\frac{24}{60} = .4$

February 12th, 2016, high tide occurred at 7:02 pm. At that time the water was 1.5 meters deep. Low tide occurred at 12:36 p.m, at which time the water was only .2 meters deep. Assume that the depth of the water is a sinusoidal function of time with a period of half a lunar day (about 12 hrs 24 min)

12.4 hr

a) Model the depth, D, as a sinusoidal function of time, t, algebraically then graph the function.

Amp $\frac{\text{max-min}}{2} = \frac{1.5-.2}{2}$

$= .65$

V.S. $= \frac{\text{max+min}}{2} = \frac{1.5+.2}{2} = .85$

$B = \frac{2\pi}{\text{per}} = \frac{2\pi}{12.4} = \frac{\pi}{6.2}$

$y = .65 \cos \frac{\pi}{6.2}(x - 19.03) + .85$

$y = -.65 \cos \frac{\pi}{6.2}(x - 12.6) + .85$

b) At what time did the first low tide occur?

c) What was the approximate depth of the water at 6:00 am and at 3:00 pm?

d) What was the first time on this day when the water was 1 meter deep?