Warm-up Name Key

Tide Problem. Mrs. Robinson is on the beach on her birthday October 31st. At 2:00 pm, high tide, she finds that the depth of the water at the end of the jetty is 0.5 meters. At 7:30 pm, low tide, the depth of the water is 0.1 meters. Assume that the depth varies sinusoidally with time.

Using the graph below, answer the following questions:

(a) Write an equation expressing depth as a function of the time that has elapsed since 12:00 midnight at the beginning of October 31st. amp = .2

VS = .3 PS = 8.5 period = 2pm → 7:30pm → 1am → 11 hrs $b = \frac{2\pi}{11}$ | $d(t) = -.2\cos\frac{2\pi}{11}(x-8.5)+.3$

(b) Predict the depth of the water at 3:00 pm on October 31st.

Enter Equation, Set Window, 2nd Calc Value X=15 Y = .47m

(c) At what time does the first high tide occur on October 31st.

Graph y=.5 2nd Calc Intersection Y = 3am

(d) Mrs. Robinson likes walking at low tide. What is the first time after noon that she can walk at low tide?

Graph y=.1 2nd Calc Intersection X = 19.5 → 7:30pm

(e) What is the first time on October 31st that the water depth will be 0.3 meters?

Graph y=.3 2nd Calc Intersection X = .25 → $\frac{1}{4}$ of 1 hour so 12:15am