

Tide Problem. Mrs. Fuston is on the beach in Ft. Pierce, Florida, on her birthday August 26th. 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 August 26th.

$$y = 0.2 \cos \frac{2\pi}{11} (x - 14) + 0.3$$

(b) Predict the depth of the water at 3:00 pm on August 26th.

0.5 m

(c) At what time does the first high tide occur on August 26th.

3 am

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

7:30 pm

(d) What is the first time on August 26th that the water depth will be 0.3 meters?

12:15 am

$$y = 0.3$$

