

Answer on Question #80443 – Math – Algebra

Question

The depth (D metres) of water in a harbour at a time (t hours) after midnight on a particular day can be modelled by the function

$$D=4\sin(0.48t-0.7)+7$$

where radians have been used.

Select the two options which are correct statements about the predictions based on this model.

Select one or more:

At midnight the depth is approximately 11 metres.

The largest depth is 7 metres.

The model can be used to predict the tide for up to 12 days.

At midday the depth is approximately 3.2 metres.

The time between the two high tides is exactly 12 hours.

The depth of water in the harbour falls after midnight.

The smallest depth is 3m

Solution

1. At midday the depth is approximately 3.2 metres.

$$D(12) = 4\sin(0.48 * 12 - 0.7) + 7 \approx 3.2 \text{ m.}$$

2. The smallest depth is 3m

$$D_{min} = -4 + 7 = 3 \text{ m.}$$