8.3 Trig Apps

The depth of water in a harbour on a particular day of the year is modelled by the equation $d = 16 - 2cos\left(\frac{\pi}{12}t\right)$, where d is measured in metres and t is the time, in hours after midnight.

(a) Find the depth of water in the harbour at midnight.
(b) Determine the maximum and minimum depth of water in the harbour.
(c) Find the first time after midnight when the water depth is 17.5 m.
(d) Find the interval of time, within the first 24 hours, when the depth of water is above 14.6 m.

The top of a flagpole sways back and forth in high winds. The top sways 10 cm to the left and to the right of its resting position, which is at t =0. The flagpole starts moving to the right and then moves back and forth 240 times every minute.

a. Draw a sketch of the graph
b. Determine a possible equation for this graph
c. Use a different function for a possible equation for this graph.

p.362#1,6-8,13