

17

A large bowl is filled with water.

As the water evaporates from the bowl, the rate of change of the depth, h cm, of the water in the bowl is modelled by

$$\frac{dh}{dt} = -\frac{h^2}{400} \left(2 + \sin \frac{t}{4} \right)$$

where t is the time in hours since the bowl was filled.

17 (a)

Given that the depth of water is initially 10 cm, show that the depth of the water in the bowl at time t is given by

$$h = \frac{200}{At + B - 2\cos \frac{t}{4}}$$

where A and B are integers to be found.

[7 marks]**17 (b)**

After 4 hours the depth of the water is measured.

It is found that the depth of the water has fallen by just under 2 cm.

Comment on the validity of the model.

[2 marks]