Part 1
Question 1

Find the solution of the equation $\quad \sin 3x = \dfrac{\sqrt{3}}{2}\quad$ over the interval $\quad 0° \leq x \leq 90°$

2 marks

Question 2

The diagram shows the temperature (T°C) in a home starting from midnight with the time (t) measured in hours
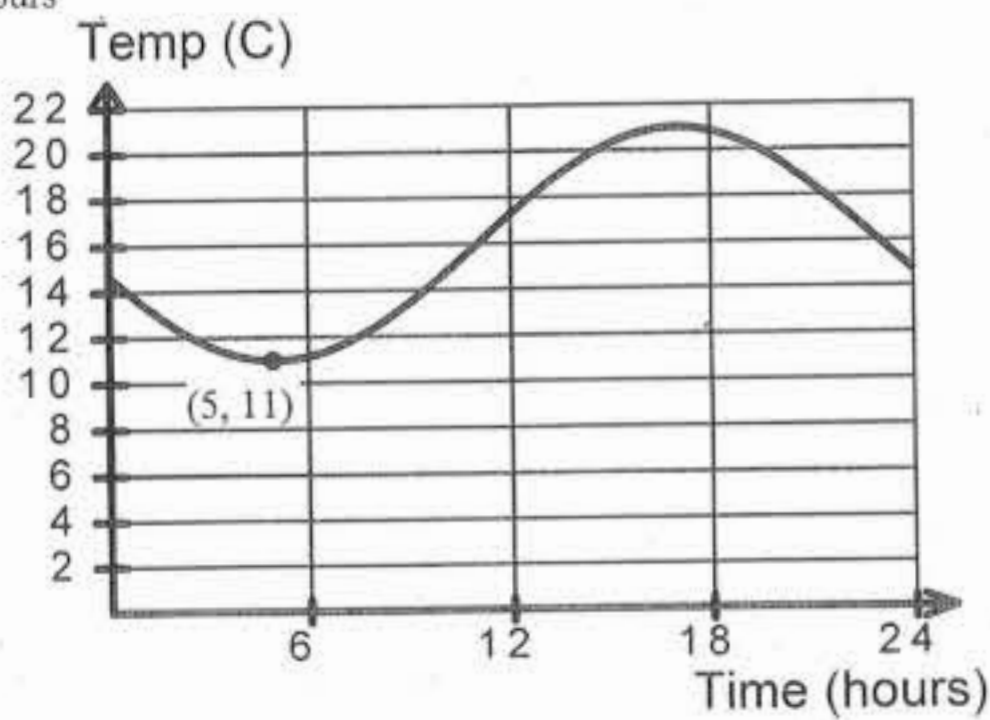
Find a function of the form $\quad T = a + b\cos c(t + d)\quad$ that models the data
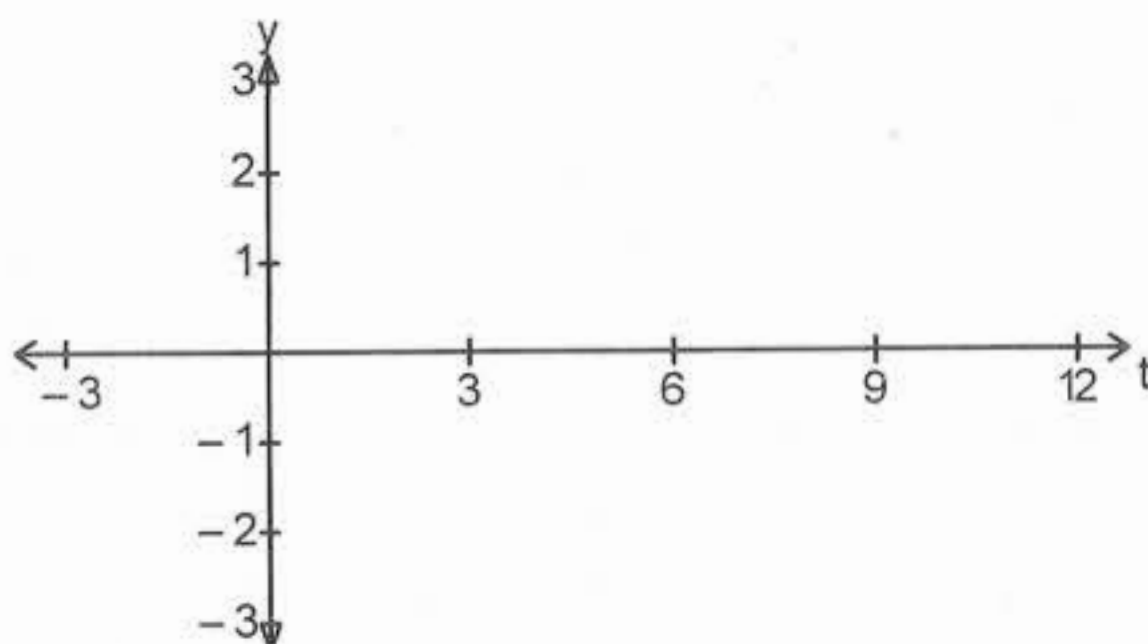
3 marks

Question 3

The height of the sea level (above a fixed point) on a given day varies over time according to the effect of the tides.

The height, y cm, is given by the equation

$$y = \frac{2}{5}\sin\left(\frac{\pi t}{6}\right) + 1$$

Where t represents the number of hours after midnight on the 21st of September 1994.

a. Sketch, on the set of axes below, a graph representing the height of the sea level on the 21st of September 94 from midnight to midday. Label all key points.

b. State

i. the period of the function

2pi/(pi/6) = 12

ii. The amplitude of the function

2/5 = 0.4

3 + 1 +1 = 5 marks

Question 4

The volume, V(t) , of water in a reservoir at time t is given by : $V(t) = 3 + 2\sin\dfrac{t}{4}$

a. What is the maximum volume in the reservoir

b. What is the minimum volume in the reservoir

1 + 1 = 2 marks