

- 8 The temperature θ °C of an oven t minutes after it is switched on can be modelled by the equation

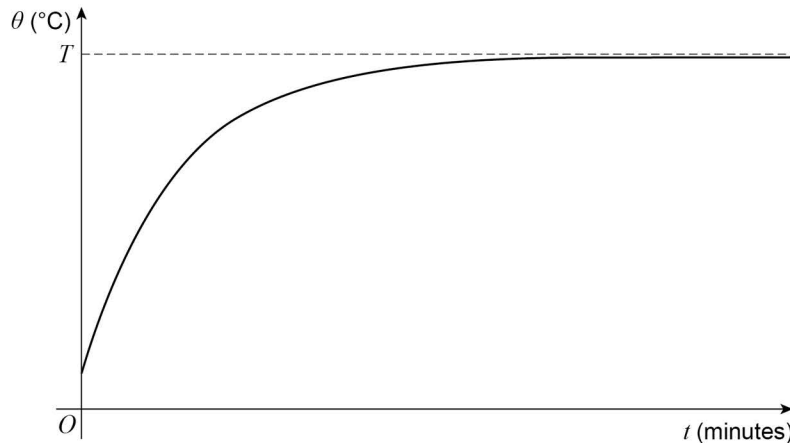
$$\theta = 20(11 - 10e^{-kt})$$

where k is a positive constant.

Initially the oven is at room temperature.

The maximum temperature of the oven is T °C

The temperature predicted by the model is shown in the graph below.



- 8 (a) Find the room temperature. [2 marks]
- 8 (b) Find the value of T . [2 marks]
- 8 (c) The oven reaches a temperature of 86 °C one minute after it is switched on.
- 8 (c) (i) Find the value of k . [2 marks]
- 8 (c) (ii) Find the time it takes for the temperature of the oven to be within 1 °C of its maximum. [2 marks]