

**Subject 26**  
**Functions**

**Please do not write on the exam paper.**

In the supermarket we can buy two different types of candles.

The first type is 20cm long when new and burns at a rate of 2.5 mm per hour. The second type is 24.5cm long when new and burns at a rate of 4 mm per hour.

We shall use  $t$  to denote the time in hours,  $h_1$  the function that gives the height in mm of the first type of candles after  $t$  hours and  $h_2$  the function that gives the height in mm of the second type of candles after  $t$  hours.

1. Find the formula for  $h_1(t)$  and for  $h_2(t)$ .
2. How long will each candle last?
3. Draw the graph of  $h_1$  and  $h_2$  on the same set of axes.
4. Suppose we light both candles at the same time. After how many hours will they have the same height?
5. If you want the candles to end at the same time, which candle would you light first, and how long after this would you light the second one?