

**6** A hot drink is cooling. The temperature of the drink at time  $t$  minutes is  $T^{\circ}\text{C}$ .

The rate of decrease in temperature of the drink is proportional to  $(T - 20)$ .

**(a)** Write down a differential equation to describe the temperature of the drink as a function of time. **[2]**

**(b)** When  $t = 0$ , the temperature of the drink is  $90^{\circ}\text{C}$  and the temperature is decreasing at a rate of  $4.9^{\circ}\text{C}$  per minute.

Determine how long it takes for the drink to cool from  $90^{\circ}\text{C}$  to  $40^{\circ}\text{C}$ . **[6]**