2 A student investigates the cooling of water under different conditions.

Fig. 2.1 shows the set-up.

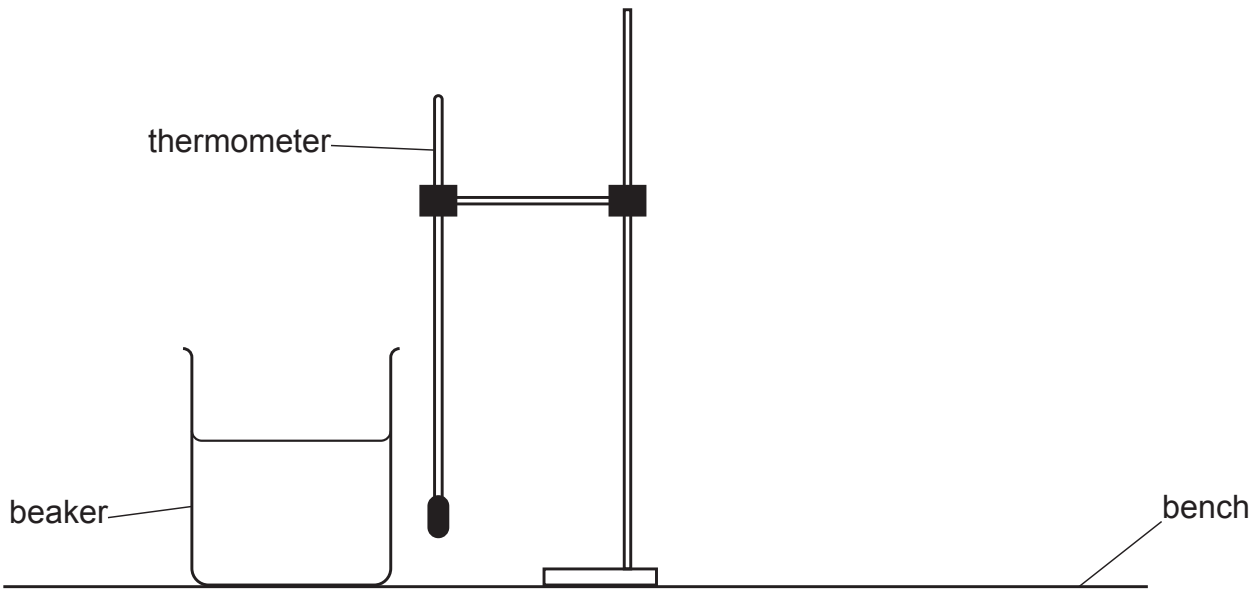

Fig. 2.1

(a) The thermometer in Fig. 2.2 shows the room temperature θ_R at the beginning of the experiment. Record θ_R.

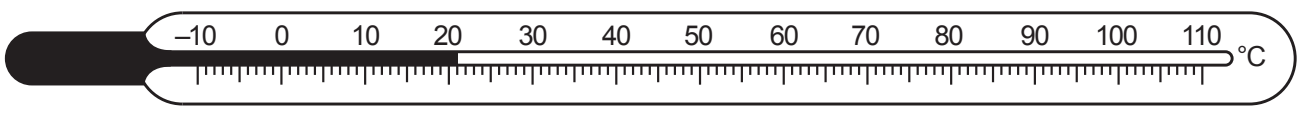

Fig. 2.2

θ_R = ... [1]

(b) The student pours 200 cm^3 of hot water into the beaker.

She records the temperature θ of the hot water at time t = 0. She immediately starts a stop-watch.
She continues recording the temperature at 30 s intervals. The temperature readings are shown in Table 2.1.

(i) Complete the column headings in Table 2.1. [1]

(ii) Complete the first column of Table 2.1.

Table 2.1

t/	θ/
	92
	84
	78
	74
	71
	69
	67

[1]

(c) **(i)** Calculate the decrease in temperature $\Delta\theta$ between t = 0 and t = 180 s.

$\Delta\theta$ = ... [1]

(ii) Calculate the average rate of cooling R of the water using the equation $R = \frac{\Delta\theta}{\Delta t}$, where Δt = 180 s. Include the unit.

R = ... [2]

(d) A student states that the average rate of cooling of the water decreases as the temperature comes nearer to room temperature.

(i) Suggest **one** change to the experiment that you could make to test the statement.

.....

..... [1]

(ii) Suggest how to display the results to make it easier to see the trend in the rate of cooling.

.....

.....

..... [2]

(e) Explain briefly why it is good practice to read the thermometer scale at right angles.

.....

..... [1]

(f) The student uses a measuring cylinder to measure 200 cm^3 of hot water. She reads the scale at right angles.

Suggest another precaution to obtain an accurate reading of the volume of the water.

.....

..... [1]

[Total: 11]