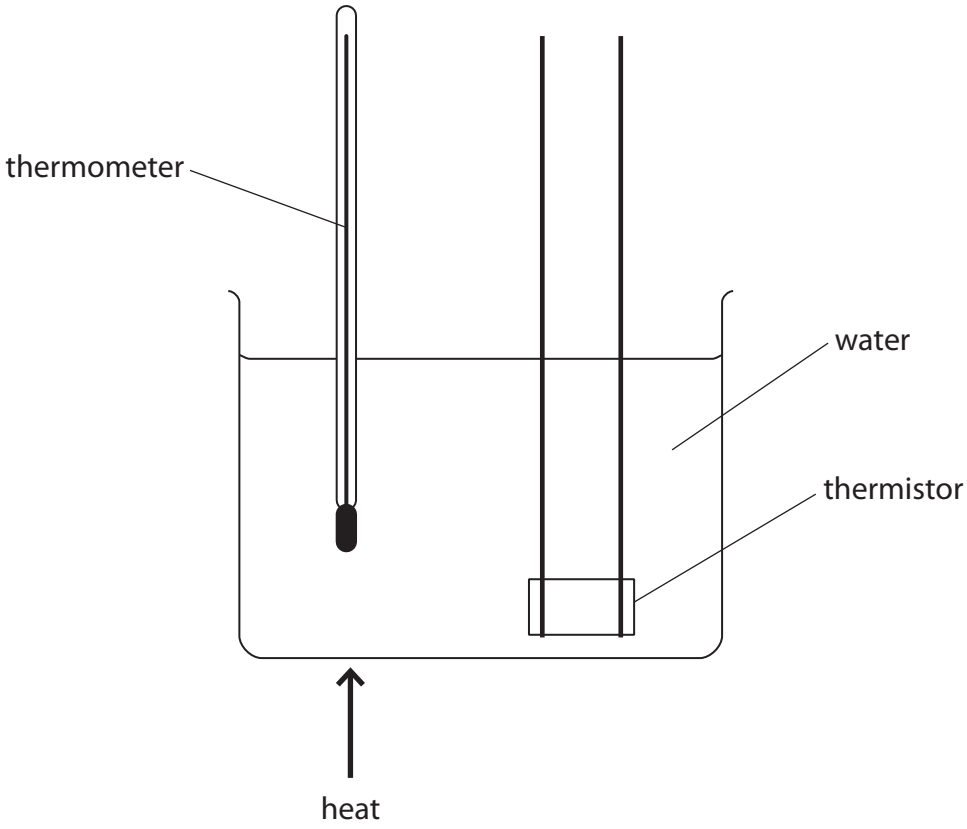
4 A student investigates how the voltage across a thermistor varies with temperature.

The student keeps the current in the thermistor constant, but varies the temperatures between 20 °C and 100 °C.

(a) The diagram shows how the student sets up his apparatus.



Suggest three changes to this set up that would improve the accuracy of the measurement of the thermistor temperature.

(3)

1 .....

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2 .....

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3 .....

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(b) What instrument should the student use to measure the current in the thermistor?

(1)

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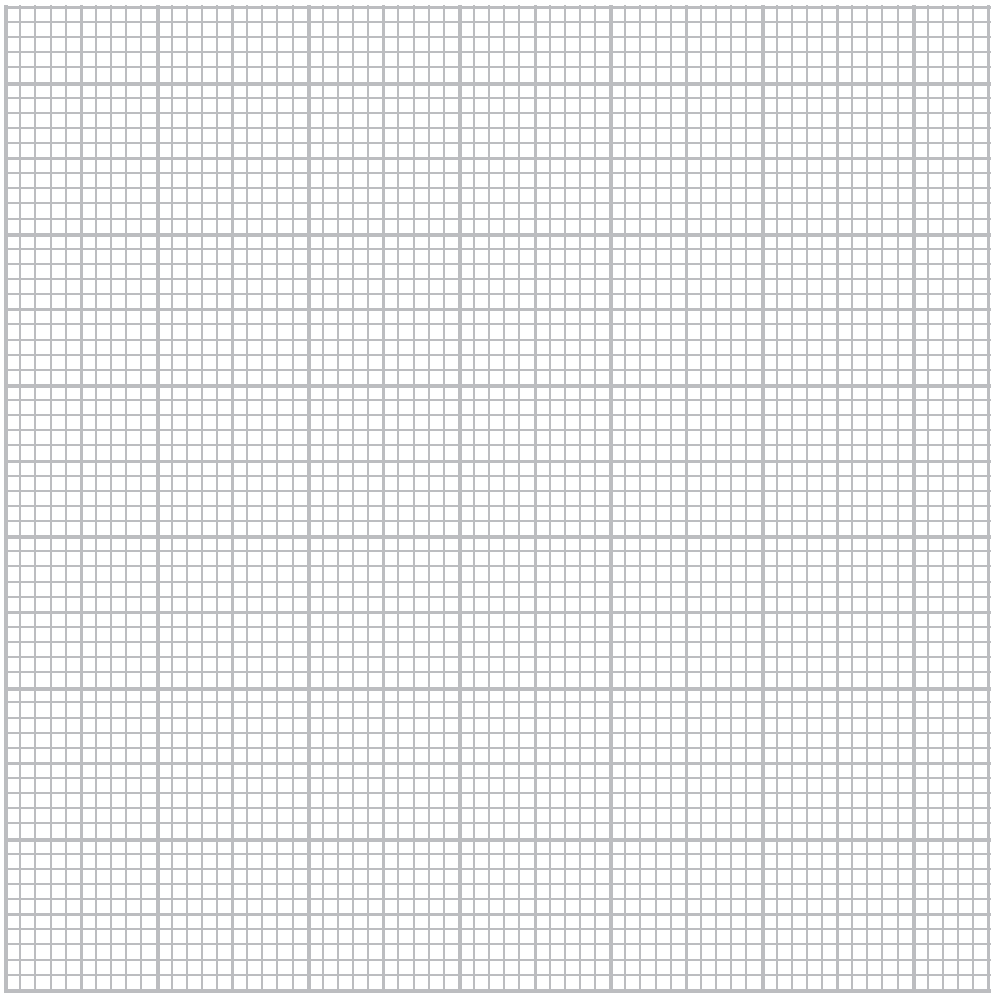
(c) The table shows the student's results.

Temperature in °C	Voltage in V
20	6.0
40	2.2
60	1.1
80	0.2
100	0.4

(i) Plot a graph of voltage against temperature and draw the line of best fit.

(5)



(ii) Circle the anomalous point on your graph.

(1)

(d) (i) State the equation linking voltage, current and resistance.

(1)

(ii) At room temperature the thermistor has a resistance of 680 Ω.

The voltage across it is 5.9 V.

Show that the current in the thermistor is about 8.5 mA.

(3)

(Total for Question 4 = 14 marks)