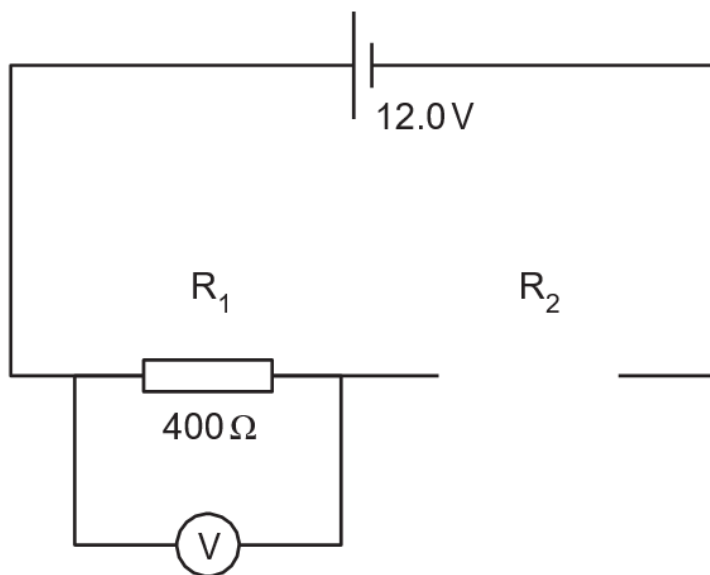


**GCSE Physics B (Twenty First Century Science)**  
**J259/03** Depth in physics (Higher Tier)

**Question Set 10**

1 Alex wants to use a thermistor as a temperature sensor.

He sets up the circuit shown below.

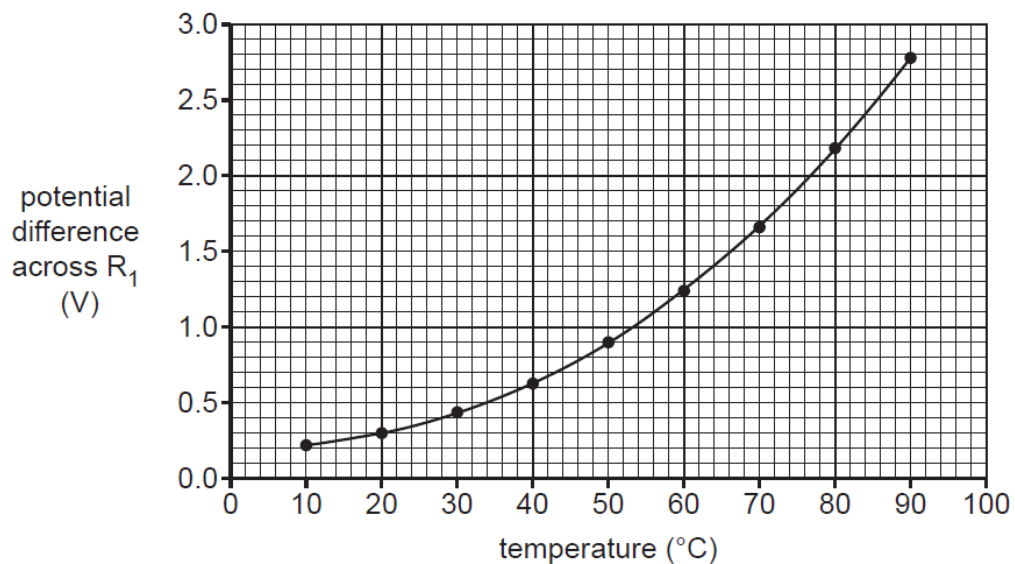


(a) Draw the symbol for a thermistor in the space labelled  $R_2$ .

[1]

(b) To investigate the sensitivity of the thermistor, Alex places it in a water bath with a temperature control.

He records the potential difference across  $R_1$  for different temperatures set by the water bath. His results are shown in the graph.



(i) Describe and explain the relationship shown in the graph

[3]

- (ii) Alex plans to use the sensor to monitor temperature in a greenhouse. To find the temperature, Alex will measure the potential difference across  $R_1$ .

He will then read the temperature off the graph.

**Alex**

My temperature sensor will be more sensitive at lower temperatures.



Evaluate Alex's statement using evidence from the graph.

- (c) Mr Orton, Alex's teacher, says that his temperature sensor will not work properly. [2]

**Mr Orton**

Your temperature sensor will always be slightly hotter than the surroundings, so it will always give a measurement that is slightly too high.



- (i) What is the name of this type of error? [1]
- (ii) Explain why Mr Orton is correct, and suggest how this problem could be reduced. [2]

**Total Marks for Question Set 10: 9**

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