

- 8 The variation with temperature of the resistance of a thermistor is shown in Fig. 8.1.

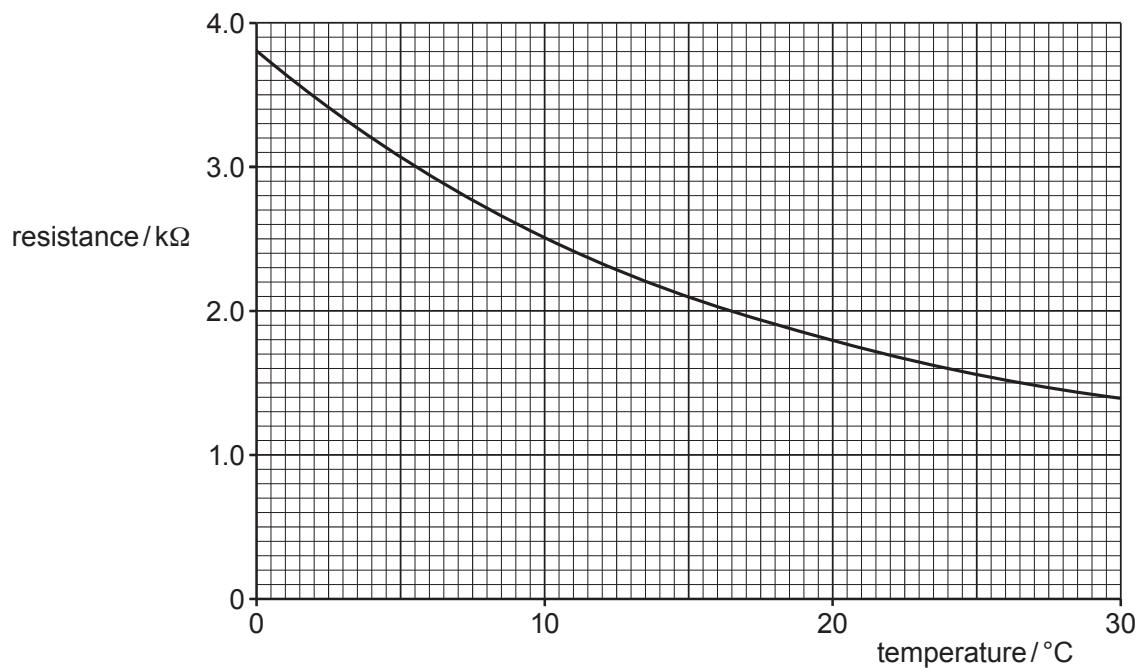


Fig. 8.1

A student includes the thermistor and an ideal operational amplifier (op-amp) in the circuit of Fig. 8.2.

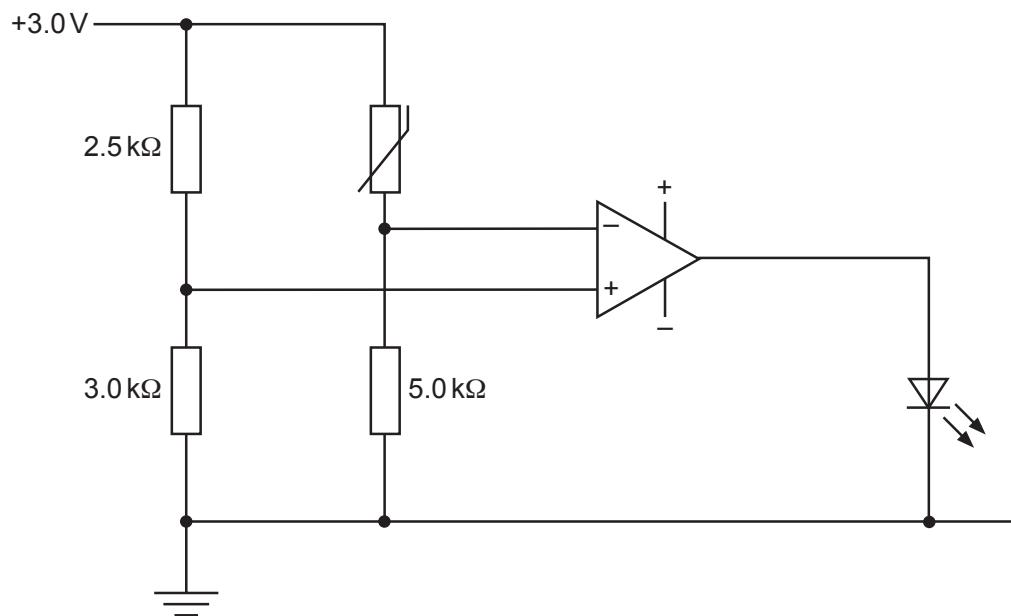


Fig. 8.2

- (a) Calculate the potential V^+ at the non-inverting input of the op-amp.

$$V^+ = \dots \text{ V} [2]$$

- (b) At 10°C , the resistance of the thermistor is $2.5\text{ k}\Omega$.

State and explain whether the light-emitting diode (LED) is emitting light.

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.....
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[2]

- (c) Explain why the student's circuit will not indicate any change in temperature above 0°C .

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[2]

- (d) The resistor of resistance $5.0\text{ k}\Omega$ is changed to a resistor of resistance R so that the LED switches on or off at a temperature of 20°C .

Determine R in $\text{k}\Omega$.

$$R = \dots \text{ k}\Omega [3]$$

[Total: 9]