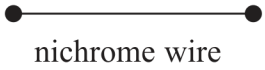
19 A student carried out an experiment to determine the resistivity of nichrome wire. Her circuit included an ammeter, a voltmeter and a variable resistor.

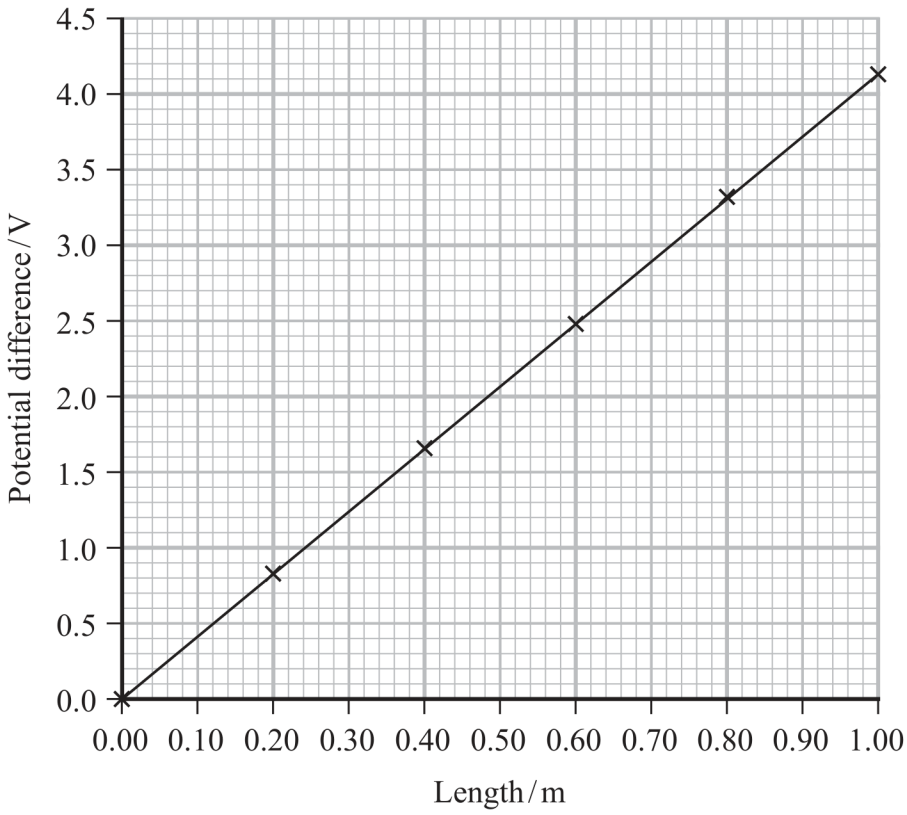
(a) Complete the circuit diagram for this experiment.

(2)



(b) The student varied the length of the nichrome wire in the circuit. For each length, she measured the potential difference across the nichrome wire. She used the variable resistor to keep the current in the wire at 0.200 A during the experiment.

The student plotted a graph of potential difference against length of nichrome wire.



(i) Determine the resistivity of nichrome.

cross sectional area of nichrome wire = $5.31 \times 10^{-8}\,m^2$

(4)

Resistivity of nichrome = ...

(ii) Calculate the power dissipated from the nichrome wire to the surroundings when the length of the wire is 0.75 m.

(3)

Power dissipated = ...

(Total for Question 19 = 9 marks)