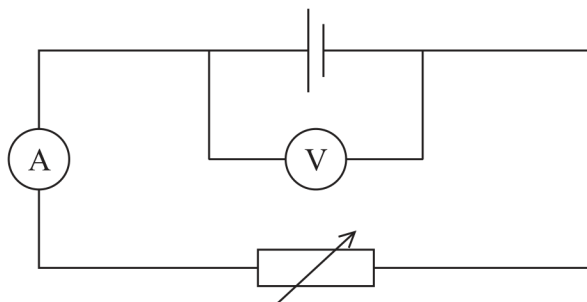


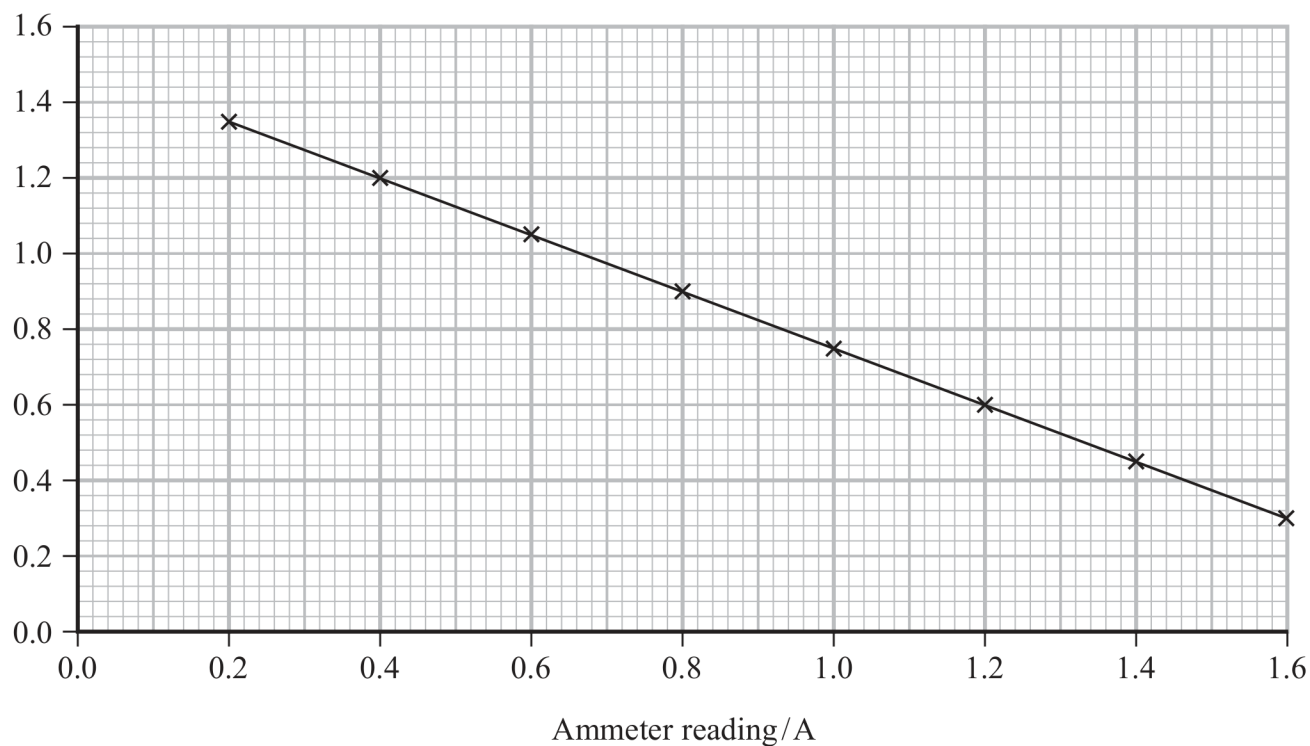
12 A student investigated the internal resistance of a cell, using the circuit shown.



The student used the variable resistor to vary the reading on the ammeter. He recorded corresponding readings from the voltmeter.

The student plotted the results on a graph, as shown.

Voltmeter reading / V



- (a) Determine the e.m.f. ε of the cell, and the internal resistance r of the cell.

(3)

$\varepsilon =$

$r =$

- (b) The student placed an identical cell in series with the original cell in the circuit.
He connected the voltmeter across both cells and repeated the investigation.

The student plotted a new graph of these voltmeter and ammeter readings.

Describe how the new graph is different from the graph for one cell.

(2)

(Total for Question 12 = 5 marks)