

2 The variation with potential difference V of current I in a resistor X is shown in Fig. 2.1.

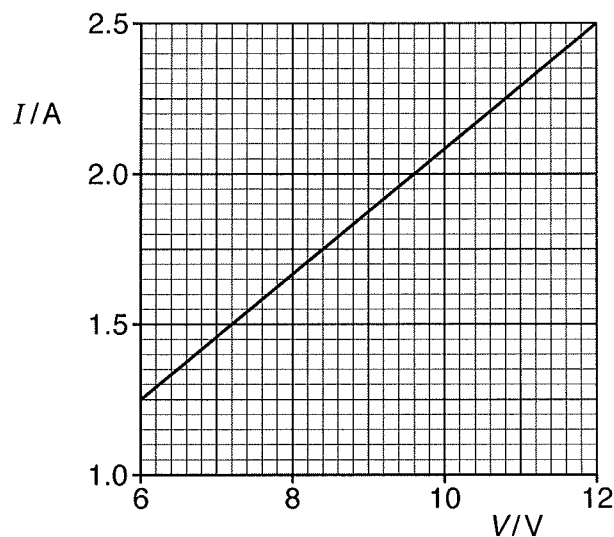


Fig. 2.1

(a) Use Fig. 2.1 to show that I is proportional to V .

[2]

(b) The resistor X is connected in the circuit shown in Fig. 2.2.

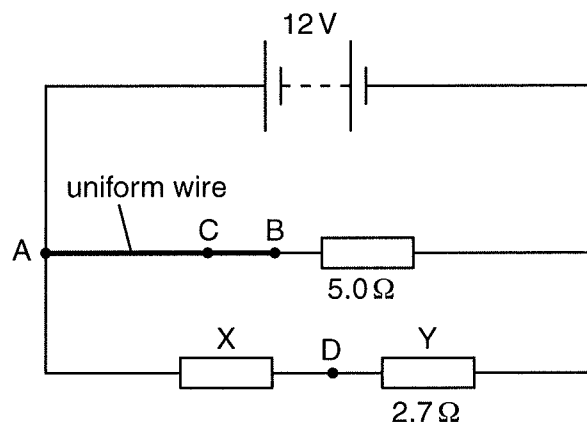


Fig. 2.2

A power supply of e.m.f. 12V and negligible internal resistance is connected across a uniform resistance wire AB and a resistor of resistance $5.0\ \Omega$.

The wire AB has length 1.0m and resistance $4.0\ \Omega$.

Resistor X and a resistor Y of resistance $2.7\ \Omega$ are connected in series across the power supply.



- (i) Calculate the resistance of resistor X.

resistance = Ω [1]

- (ii) Calculate the current in

1. the wire AB,

current = A [1]

2. the resistor X.

current = A [1]

- (iii) On Fig. 2.2, point C is a point at a distance 75 cm from point A on the wire AB.
Point D is the point between resistors X and Y.
Calculate the potential difference between the points C and D.

potential difference = V [3]

