

- 3 A cell of electromotive force (e.m.f.) 1.5 V and internal resistance $1.8\ \Omega$ is connected to two resistors X and Y, as shown in Fig. 3.1.

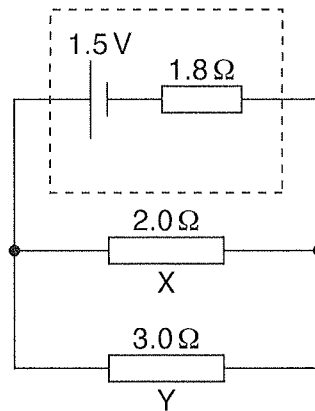


Fig. 3.1

Resistor X has resistance $2.0\ \Omega$. Resistor Y has resistance $3.0\ \Omega$.

- (a) Show that the current in the cell is 0.50 A .

[3]

- (b) Determine the ratio

$$\frac{\text{total power transfer in the two external resistors}}{\text{power transfer in the cell}}.$$

ratio = [3]

- (c) The resistance of resistor X is increased to $4.5\ \Omega$. State and explain the change in the ratio calculated in (b).

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..... [2]

