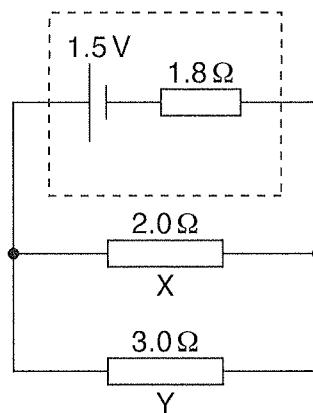


- 3 A cell of electromotive force (e.m.f.) 1.5V and internal resistance  $1.8\Omega$  is connected to two resistors X and Y, as shown in Fig. 3.1.



**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  $0.50\text{A}$ .

[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).

.....  
.....  
.....

[2]

