

APOLLO

Current and circuits

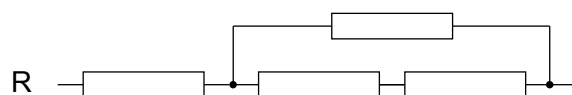
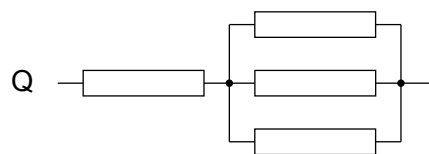
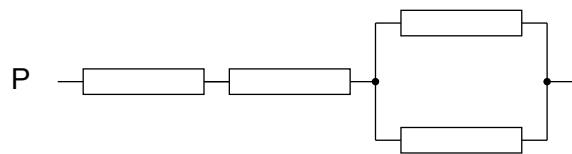
SL

Physics

First assessment 2025

10 questions | questions

10. Three combinations of resistors are shown. The resistors are identical.

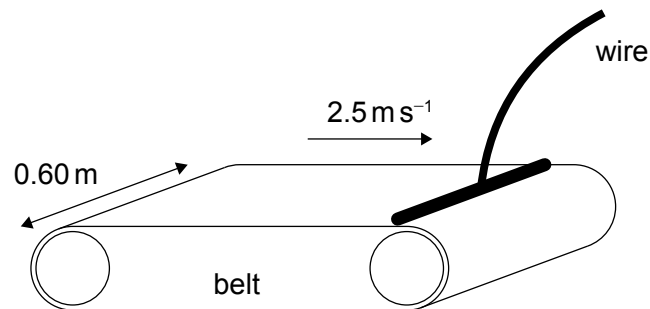


What is the total resistance of each combination of resistors in order of **increasing** resistance?

- A. P Q R
- B. Q P R
- C. P R Q
- D. Q R P

11. A continuous belt of width 0.60 m travels at a constant speed of 2.5 m s^{-1} . The belt has a uniform distribution of charge of 5.0 mC m^{-2} on its surface.

As the belt passes a point all the charge is removed and is carried as a current in a wire.



What is the current in the wire?

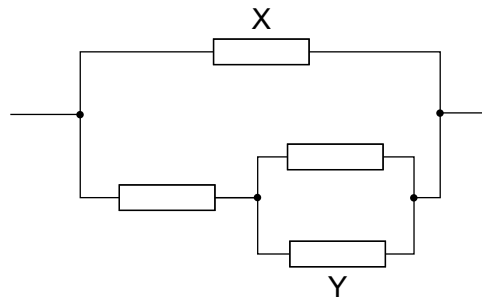
- A. 1.2 mA
- B. 7.5 mA
- C. 19 mA
- D. 21 mA

9. A wire of length L is used in an electric heater. When the potential difference across the wire is 200 V, the power transferred in the wire is 500 W. A second wire is made from the same metal and has the same cross-sectional area. When a potential difference of 400 V is applied across the second wire, the power transferred is 2000 W.

What is the length of the second wire?

- A. $\frac{L}{4}$
- B. $\frac{L}{2}$
- C. L
- D. $2L$

10. Four identical resistors are connected as shown.



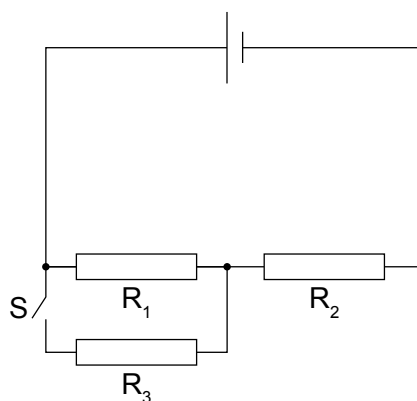
What is $\frac{\text{current in X}}{\text{current in Y}}$?

- A. $\frac{1}{2}$
- B. $\frac{2}{3}$
- C. $\frac{3}{2}$
- D. 3

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2225-0710

11. Three identical resistors, R_1 , R_2 and R_3 , each of resistance 2Ω , are connected to a cell of negligible internal resistance as shown. When switch S is open, the power dissipated by R_1 is 18 W .



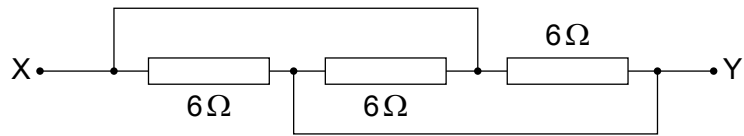
What is the power dissipated by R_1 when S is closed?

- A. 8 W
- B. 16 W
- C. 18 W
- D. 36 W

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2225-0122

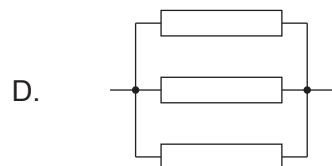
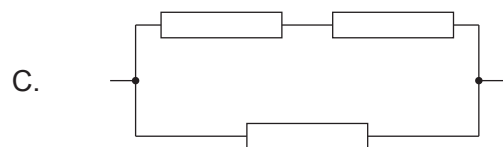
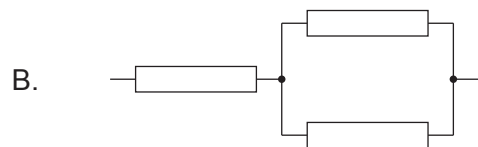
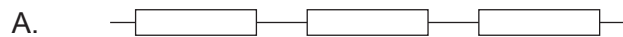
12. Three identical resistors of 6Ω are arranged as shown.



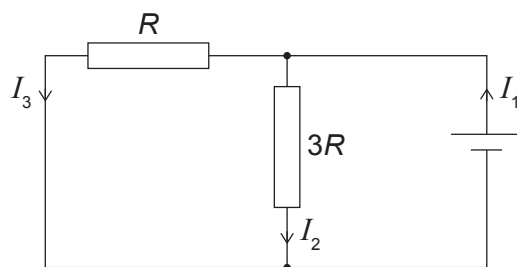
What is the resistance between X and Y?

- A. 2Ω
- B. 4Ω
- C. 9Ω
- D. 18Ω

- 12.** Three identical resistors are arranged in four different networks. The same potential difference is applied across each network. Which network dissipates the greatest electrical power?



11. In the circuit shown, the cell has negligible internal resistance.



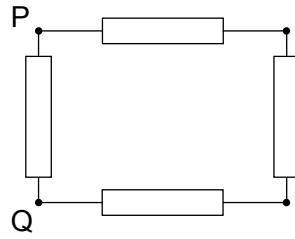
Which equation is correct?

- A. $I_1 = 4(I_2 + I_3)$
- B. $I_1 = 4I_2$
- C. $I_3 = 4I_2$
- D. $I_3 = \frac{4I_1}{3}$

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0020-0122

10. Four identical resistors, each of resistance R , are connected as shown.



What is the effective resistance between P and Q?

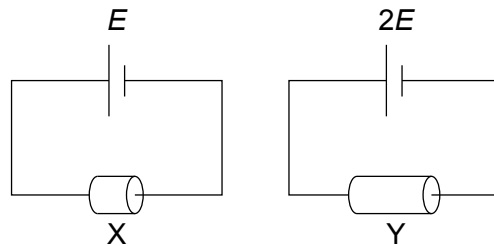
- A. $\frac{3R}{4}$
- B. R
- C. $\frac{4R}{3}$
- D. $4R$

11. Conductor X is connected to a cell of emf E . A power of 16 W is dissipated in X.

Conductor Y is made from the same material with the same diameter as X but is twice as long. A cell of emf $2E$ is connected to Y.

Both cells have negligible internal resistance.

What power is dissipated in Y?



- A. 8.0 W
- B. 16 W
- C. 32 W
- D. 64 W