

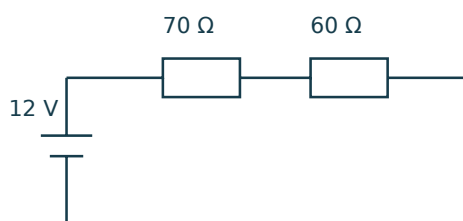
DC circuits and electrical energy

Questions · Set 42 · Selected AQA 7408 / OCR A H556 skills
Treat the given values as exact unless an uncertainty is stated.

Question 1

Resistors of $70\ \Omega$ and $60\ \Omega$ are connected in series. Find the total resistance. Give your answer to 3 significant figures.

Ideal DC supply, wires and meters. Resistors have constant resistance; heating does not change their values.



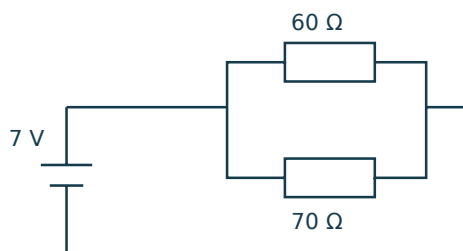
dc-circuits / series / v1.0.0 / seed 42

Check this question online: physicshelp.co.uk/tools/dc-circuits/

Question 2

Resistors of $60\ \Omega$ and $70\ \Omega$ are connected in parallel. Find the total resistance. Give your answer to 3 significant figures.

Ideal DC supply, wires and meters. Resistors have constant resistance; heating does not change their values.



dc-circuits / parallel / v1.0.0 / seed 104771

Check this question online: physicshelp.co.uk/tools/dc-circuits/

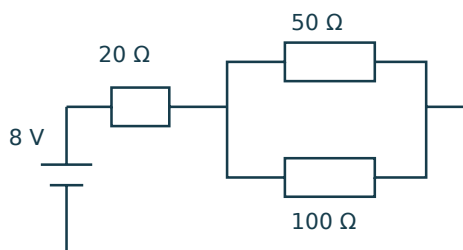
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Question 3

A $20\ \Omega$ resistor is in series with a parallel pair of $50\ \Omega$ and $100\ \Omega$. An ideal $8\ \text{V}$ supply is connected across the complete combination. Find the supply current. Give your answer to 3 significant figures.

Ideal DC supply, wires and meters. Resistors have constant resistance; heating does not change their values.



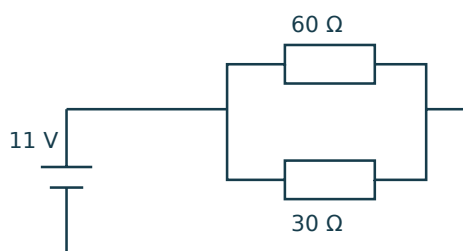
dc-circuits / mixed-current / v1.0.0 / seed 209500

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Question 4

A $60\ \Omega$ resistor and a $30\ \Omega$ resistor are in parallel across an ideal $11\ \text{V}$ supply. Find current through the $60\ \Omega$ branch. Give your answer to 3 significant figures.

Ideal DC supply, wires and meters. Resistors have constant resistance; heating does not change their values.



dc-circuits / branch-current / v1.0.0 / seed 314229

Check this question online: physicshelp.co.uk/tools/dc-circuits/

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Question 5

A steady current of 0.3 A flows for 9 min. Find the charge passing a point in the circuit. Give your answer to 3 significant figures.

Ideal DC supply, wires and meters. Resistors have constant resistance; heating does not change their values.

dc-circuits / charge / v1.0.0 / seed 418958

Check this question online: [physicshelp.co.uk/tools/dc-circuits/](https://www.physicshelp.co.uk/tools/dc-circuits/)

Question 6

A $90\ \Omega$ resistor has 8 V across it. Find its electrical power dissipation. Give your answer to 3 significant figures.

Ideal DC supply, wires and meters. Resistors have constant resistance; heating does not change their values.

dc-circuits / resistor-power / v1.0.0 / seed 523687

Check this question online: [physicshelp.co.uk/tools/dc-circuits/](https://www.physicshelp.co.uk/tools/dc-circuits/)

Worked answers

DC circuits and electrical energy

Keep intermediate values unrounded. Final answers use 3 significant figures.

Question 1

$$R_{\text{total}} = 70 + 60 \, \Omega.$$

Answer: $1.30 \times 10^2 \, \Omega$ (3 significant figures).

Question 2

$$R_{\text{total}} = (60 \times 70)/(60 + 70) \, \Omega.$$

Answer: $3.23 \times 10^1 \, \Omega$ (3 significant figures).

Question 3

$$R_{\text{parallel}} = (50 \times 100)/(50+100) \, \Omega.$$

$$I = 8/[20 + (50 \times 100)/(50+100)] \, \text{A}.$$

Answer: $1.50 \times 10^{-1} \, \text{A}$ (3 significant figures).

Question 4

$$I_1 = 11/60 \, \text{A}.$$

Answer: $1.83 \times 10^{-1} \, \text{A}$ (3 significant figures).

Question 5

$$t = 9 \times 60 \, \text{s}.$$

$$Q = 0.3 \times 540 \, \text{C}.$$

Answer: $1.62 \times 10^2 \, \text{C}$ (3 significant figures).

Question 6

$$P = 8^2/90 \, \text{W}.$$

Answer: $7.11 \times 10^{-1} \, \text{W}$ (3 significant figures).