NAME _____ CLASS _____

SERIES CIRCUITS: STEP BY STEP

In a **series** circuit, add the resistor values together: $R_T = R_1 + R_2 + ...$

Follow the three steps every time: **1** write the formula, **2** put in the numbers, **3** write the answer with Ω.

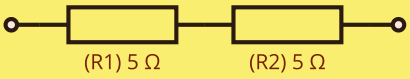
WORKED EXAMPLE R_1 = 10 Ω and R_2 = 15 Ω in series.

1 $R_T = R_1 + R_2$ 2 $R_T = 10 + 15$ 3 **R_T = 25 Ω**

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1 Calculate R_T for each series circuit. 12 marks

A

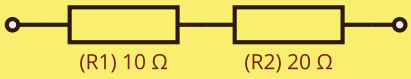


1 $R_T = R_1 + R_2$

2 R_T = ___ + ___

3 R_T = _____ Ω

B

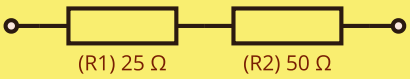


1 $R_T = R_1 + R_2$

2 R_T = ___ + ___

3 R_T = _____ Ω

C

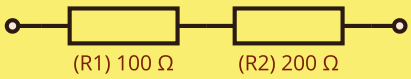


1 $R_T = R_1 + R_2$

2 R_T = ___ + ___

3 R_T = _____ Ω

D

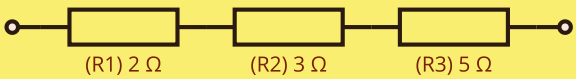


1 $R_T = R_1 + R_2$

2 R_T = ___ + ___

3 R_T = _____ Ω

E

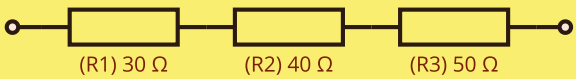


1 $R_T = R_1 + R_2 + R_3$

2 R_T = ___ + ___ + ___

3 R_T = _____ Ω

F



1 $R_T = R_1 + R_2 + R_3$

2 R_T = ___ + ___ + ___

3 R_T = _____ Ω

PARALLEL CIRCUITS: EQUAL RESISTORS

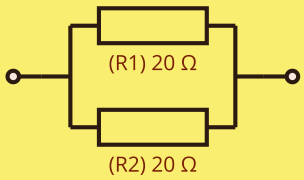
When **two equal resistors** are in parallel, the total resistance is **half** of one resistor. The current has two equal paths to choose from.

You can also use the full formula: $R_T = (R_1 \times R_2) \div (R_1 + R_2)$. Both ways give the same answer.

WORKED EXAMPLE Two 10 Ω resistors in parallel.
$R_T = (10 \times 10) \div (10 + 10) = 100 \div 20 =$ **5 Ω** (half of 10 = 5 ✓)

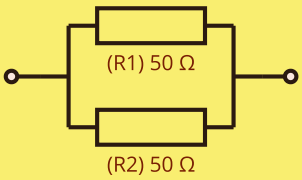
2 Calculate R_T for each parallel circuit. 8 marks

A



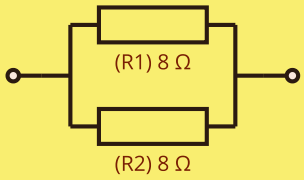
WORKING

B



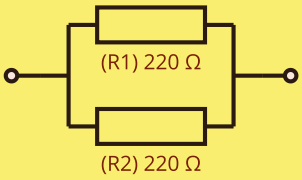
WORKING

C



WORKING

D



WORKING

3 Complete the sentence: Two equal resistors in parallel give a total resistance that is _____ of one resistor. 1 mark