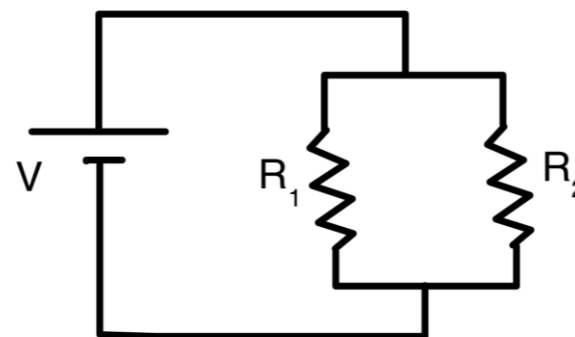
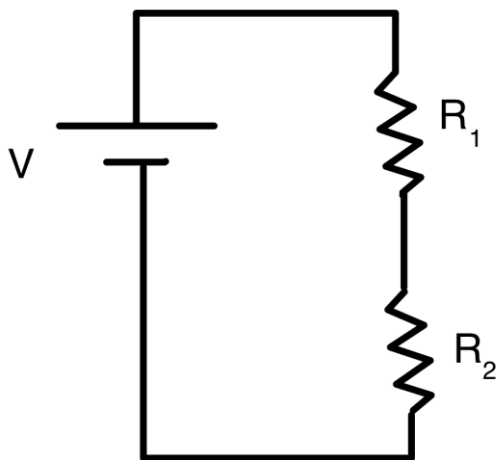


# Equivalent circuits

Whenever we have resistors in series or in parallel we can substitute them with an equivalent resistance that simplifies the calculation of the electric circuit.

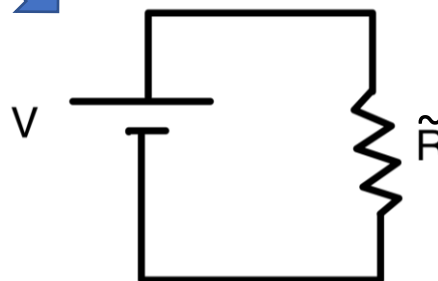


**Series:**

$$\tilde{R} = R_1 + R_2$$

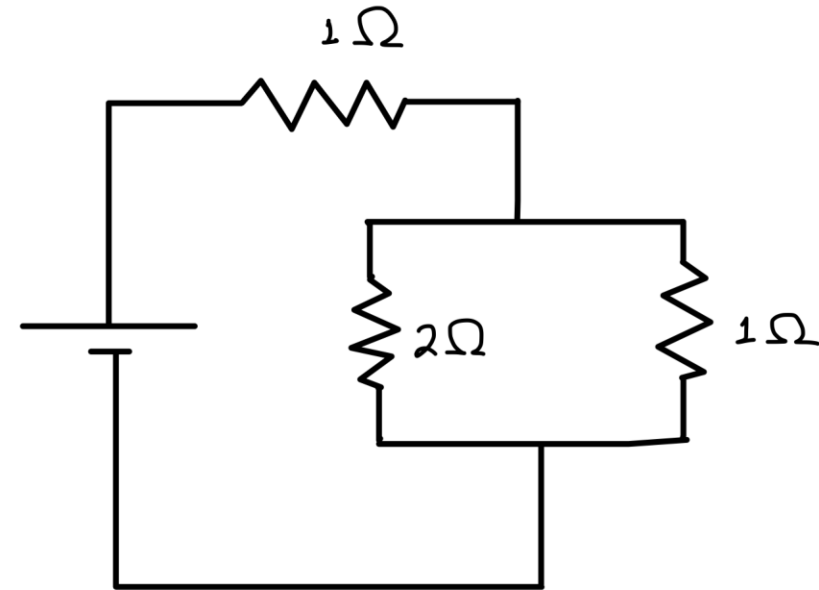
**Parallel:**

$$\frac{1}{\tilde{R}} = \frac{1}{R_1} + \frac{1}{R_2}$$

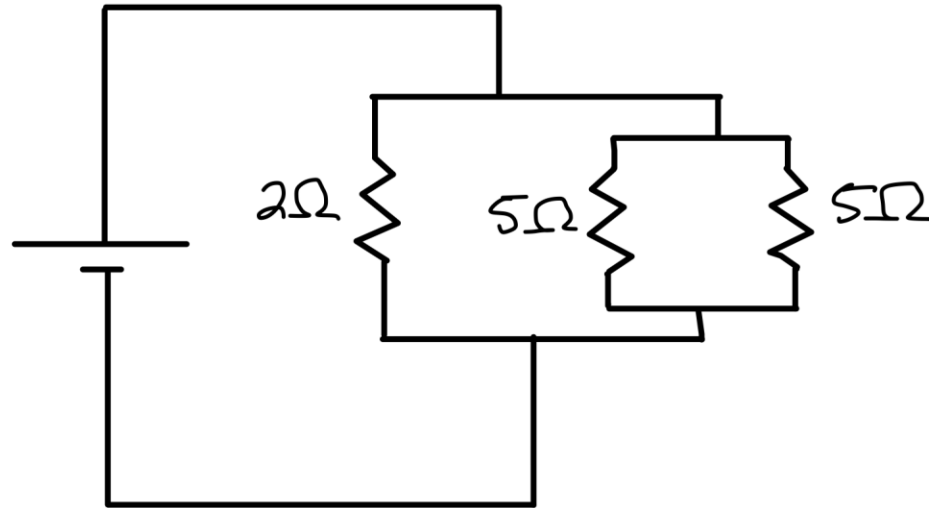


# Homework

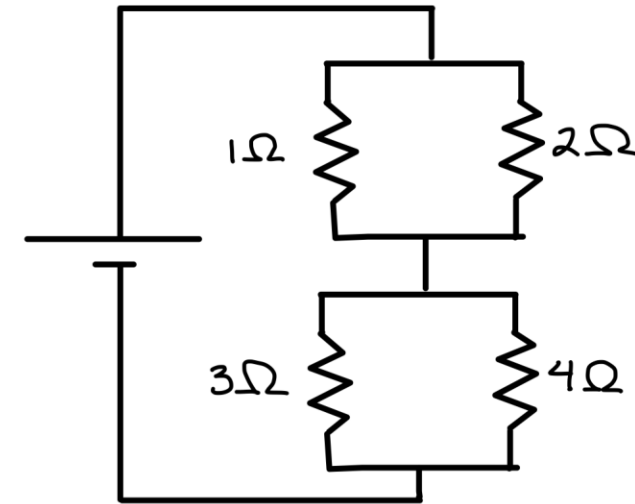
**Problem 1.** Find the equivalent resistance for the following circuits:



$$\tilde{R} = \underline{\hspace{2cm}}$$



$$\tilde{R} = \underline{\hspace{2cm}}$$



$$\tilde{R} = \underline{\hspace{2cm}}$$

Now, go to <https://www.brainpop.com/games/circuitconstructionkitdc/> and click “Play game” and then select the “Intro” option. Check your answer experimentally (do it only after you did your own calculations).