Answer on Question #68795, Electric Circuits

If $4A$ current is flowing in a resistor r power dissipated is P_1. The resistor is cut into 4 equal pieces and power dissipated is P_2. The ratio of P_2/P_1 is

Solution.

$$P_1 = I^2 r \ ; \ I - current$$

$$P_1 = 16r$$

If resistor pieces are in series circuit:

$$I_1 = I_2 \ ; \ P_1 = P_2$$

$$\frac{P_2}{P_1} = 1$$

If resistor pieces are in parallel circuit:

$$P_2 = 4I_2^2 \frac{r}{4} = 4 \cdot \left(\frac{I}{4}\right)^2 \frac{r}{4} = \frac{I^2 r}{16} = r$$

$$\frac{P_2}{P_1} = \frac{1}{16}$$