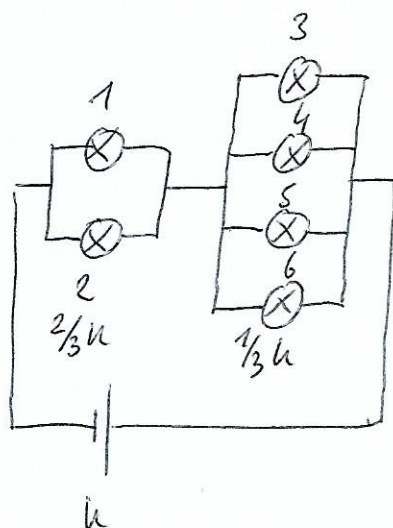# Extra oefeningen stroomkringen met lampen

alle lampen zijn identiek, met weerstand R

①

Bereken het vermogen van elke lamp:

L_{12} krijgen $\frac{2}{3}u$ spanning, de weerstand van één lamp is R

$$P = \frac{u^2}{R} \implies P_{L_1} = P_{L_2} = \frac{\left(\frac{2}{3}u\right)^2}{R}$$

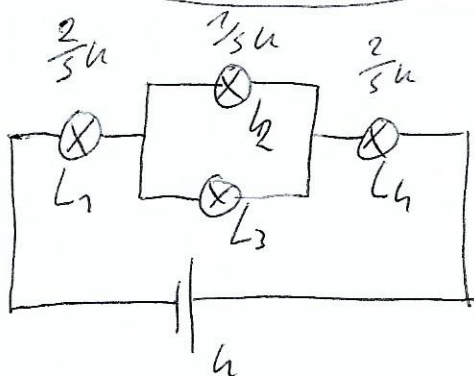$$\implies P_{L_1} = P_{L_2} = \frac{4}{9}\frac{u^2}{R}$$

De eerste twee lampen branden 4x harder.

$$P_{L_3} = P_{L_4} = P_{L_5} = P_{L_6} = \frac{\left(\frac{1}{3}u\right)^2}{R}$$
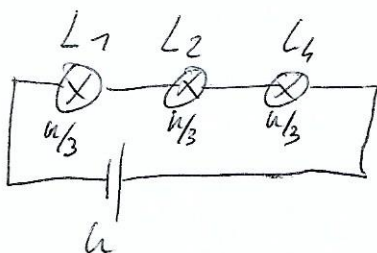
$$P_{L_3} = \frac{1}{9}\frac{u^2}{R}$$

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②

de spanning over de parallel-schakeling is half zo groot Omdat $R_S = \frac{R}{2}$

$$P_{L_1} = P_{L_4} = \frac{\left(\frac{2}{5}u\right)^2}{R} = \frac{4}{25}\frac{u^2}{R}$$

$$P_{L_3} = P_{L_2} = \frac{\left(\frac{1}{5}u\right)^2}{R} = \frac{1}{25}\frac{u^2}{R}$$

Als we nu L_3 loschakelen wordt dit:

$$P_{L_1} = P_{L_2} = P_{L_4} = \frac{\left(\frac{u}{3}\right)^2}{R} = \frac{1}{9}\frac{u^2}{R}$$

dus L_2 gaat harder branden en L_1 en L_4 minder hard. $\left(\frac{1}{9} > \frac{1}{25}\right)$

$$\left(\frac{1}{9} < \frac{4}{25}\right)$$