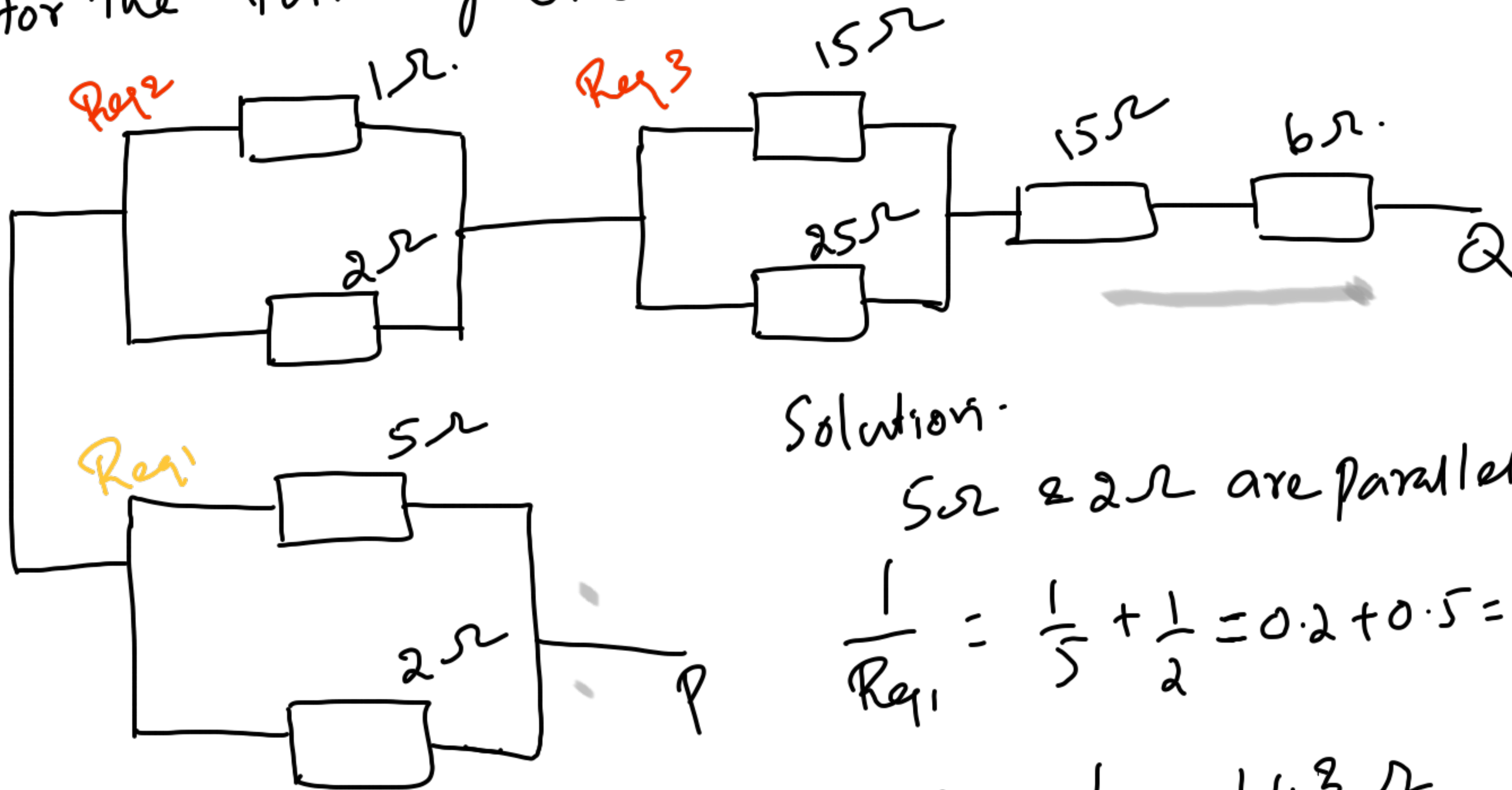


7) Calculate the total Resistance for the following Circuit.



Solution:

5Ω & 2Ω are parallel.

$$\frac{1}{R_{eq1}} = \frac{1}{5} + \frac{1}{2} = 0.2 + 0.5 = 0.7$$

$$R_{eq1} = \frac{1}{0.7} = 1.43\Omega$$

$$\frac{1}{R_{eq2}} = \frac{1}{1} + \frac{1}{2} = 1 + 0.5 = 1.5$$

$$R_{eq2} = \frac{1}{1.5} = 0.67 \Omega$$

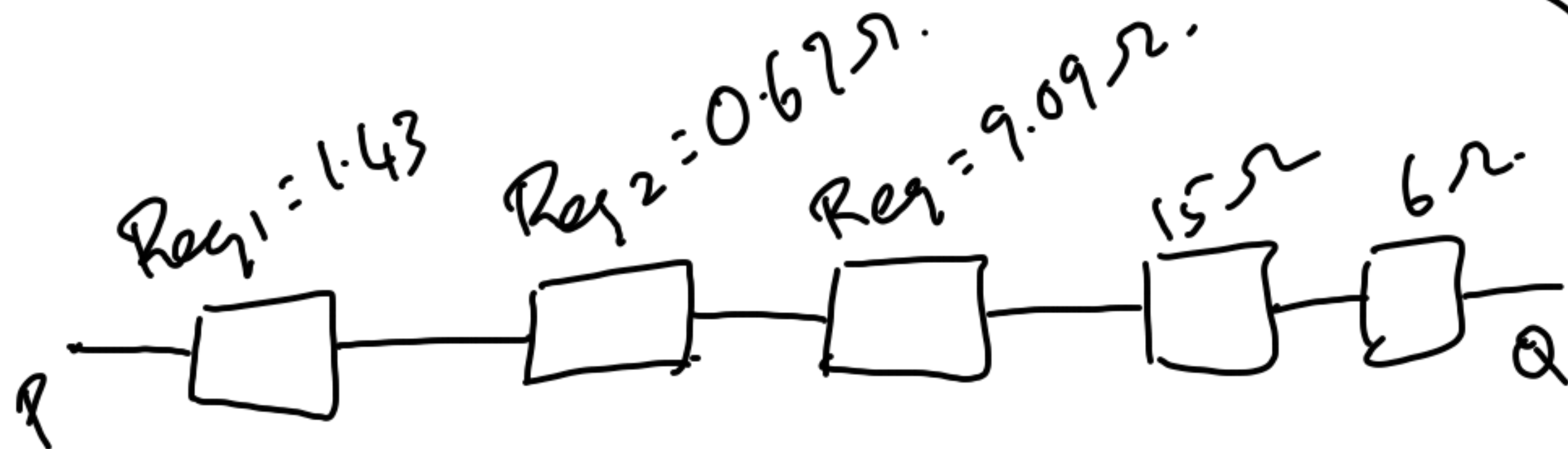
$$\frac{1}{R_{eq3}} = \frac{1}{15} + \frac{1}{25} = 0.11$$

$$R_{eq3} = \frac{1}{0.11} = 9.09 \Omega$$

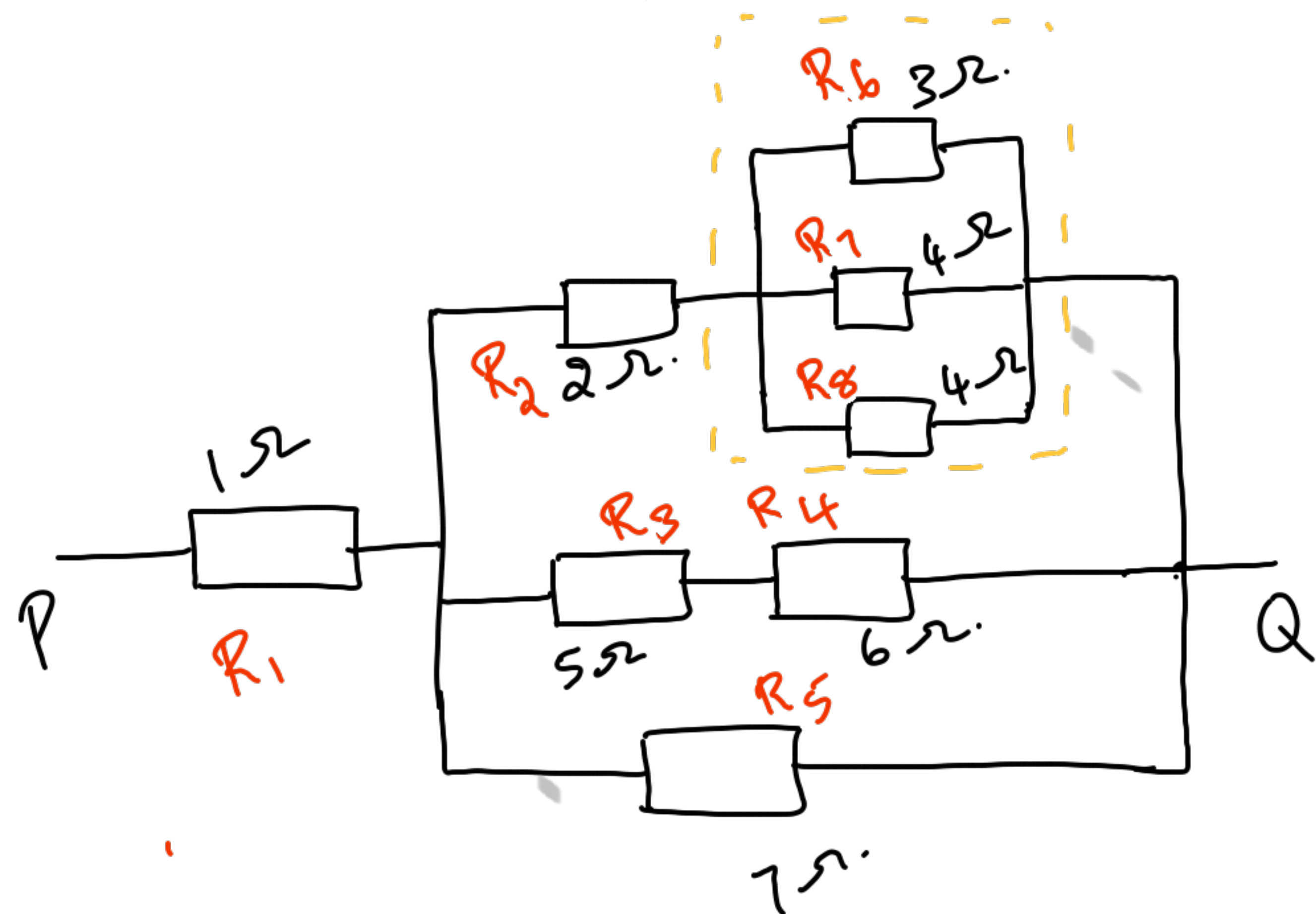
$$R_{eq} = R_{eq1} + R_{eq2} + R_{eq3} + 15 + 6$$

$$= 1.43 + 0.67 + 9.09 + 15 + 6$$

$$R_{eq} = 32.47 \Omega$$



8) Calculate the total Resistance in the following circuit



Solution.

R_6, R_7 and R_8 are parallel.

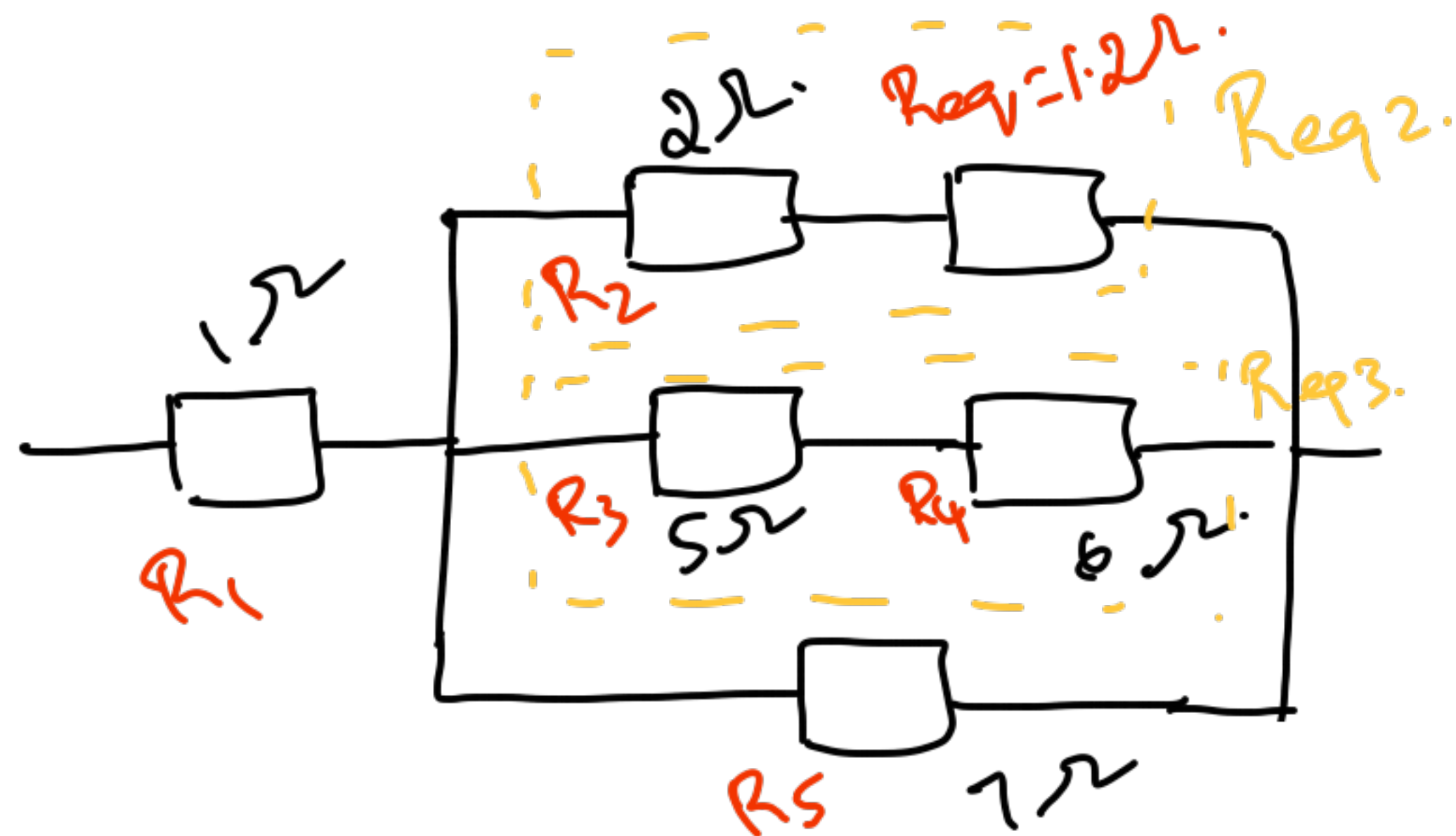
$$\frac{1}{R_{eq1}} = \frac{1}{R_6} + \frac{1}{R_7} + \frac{1}{R_8}$$

$$= \frac{1}{3} + \frac{1}{4} + \frac{1}{4}$$

$$\frac{1}{R_{eq1}} = 0.83$$

$$R_{eq1} = \frac{1}{0.83}$$

$$R_{eq1} = 1.2\Omega$$



R_2 and R_{eq1} are in series

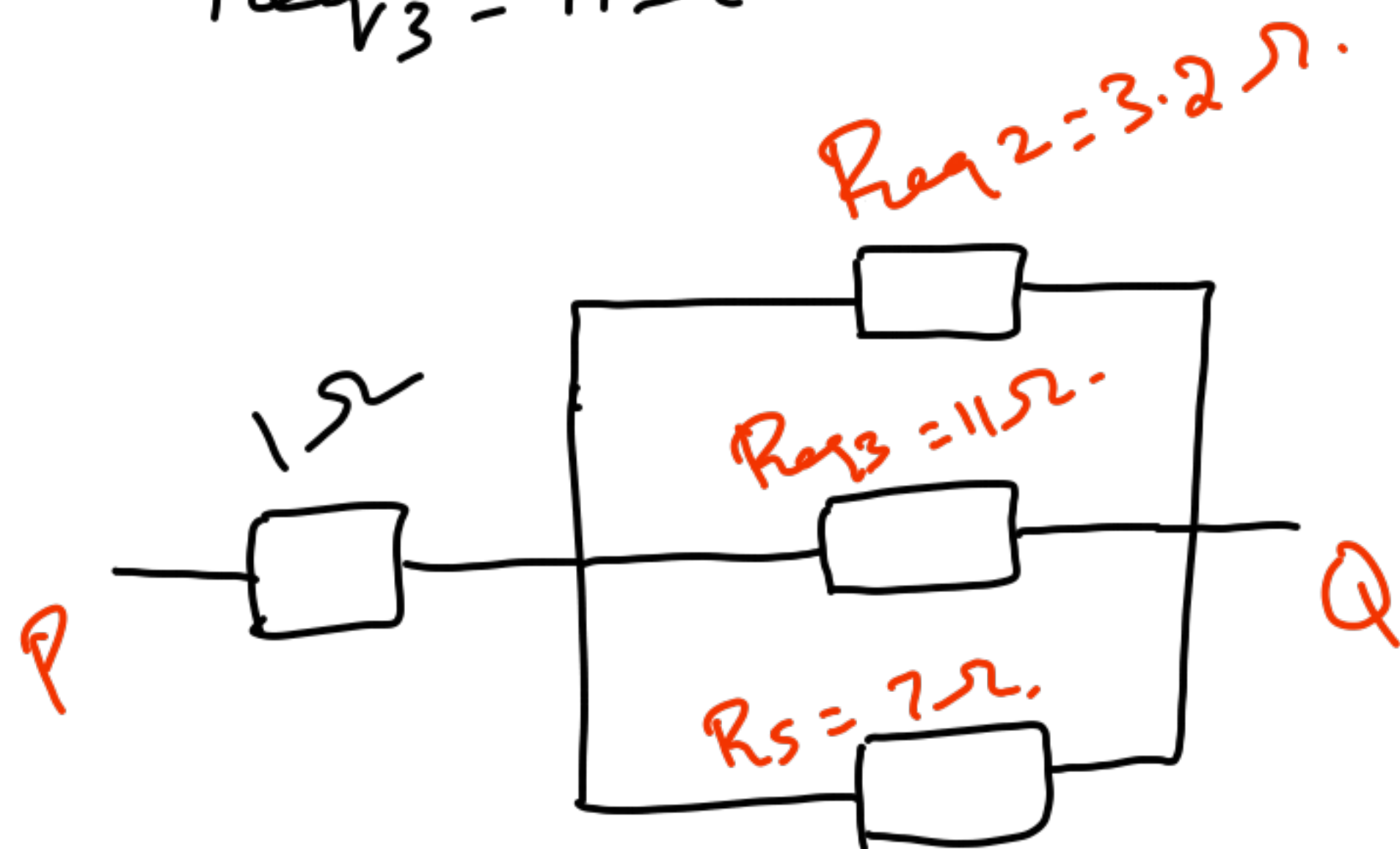
$$R_{eq2} = R_2 + R_{eq1} = 2 + 1.2$$

$$R_{eq2} = 3.2\Omega$$

R_3 and R_4 are in series.

$$R_{eq3} = R_3 + R_4 = 5 + 6 = 11\Omega$$

$$R_{eq3} = 11\Omega$$



P

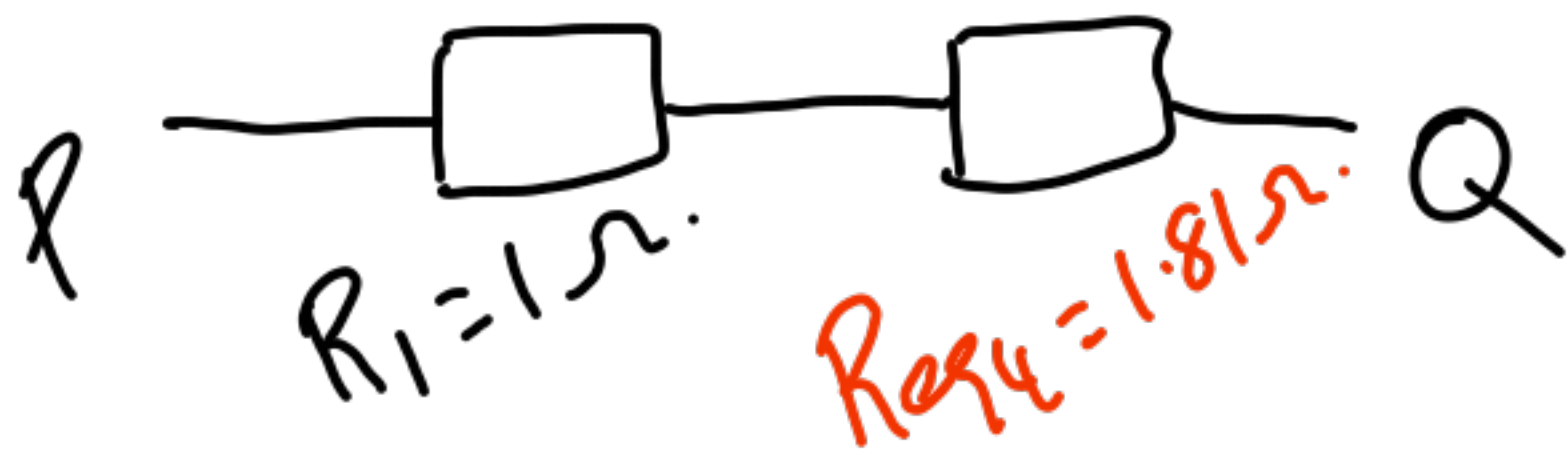
Q

R_{eq2} , R_{eq3} and R_5 are parallel.

$$\frac{1}{R_{eq4}} = \frac{1}{R_{eq2}} + \frac{1}{R_{eq3}} + \frac{1}{R_5}$$
$$= \frac{1}{3.2} + \frac{1}{11} + \frac{1}{7}$$

$$\frac{1}{R_{eq4}} = 0.55$$

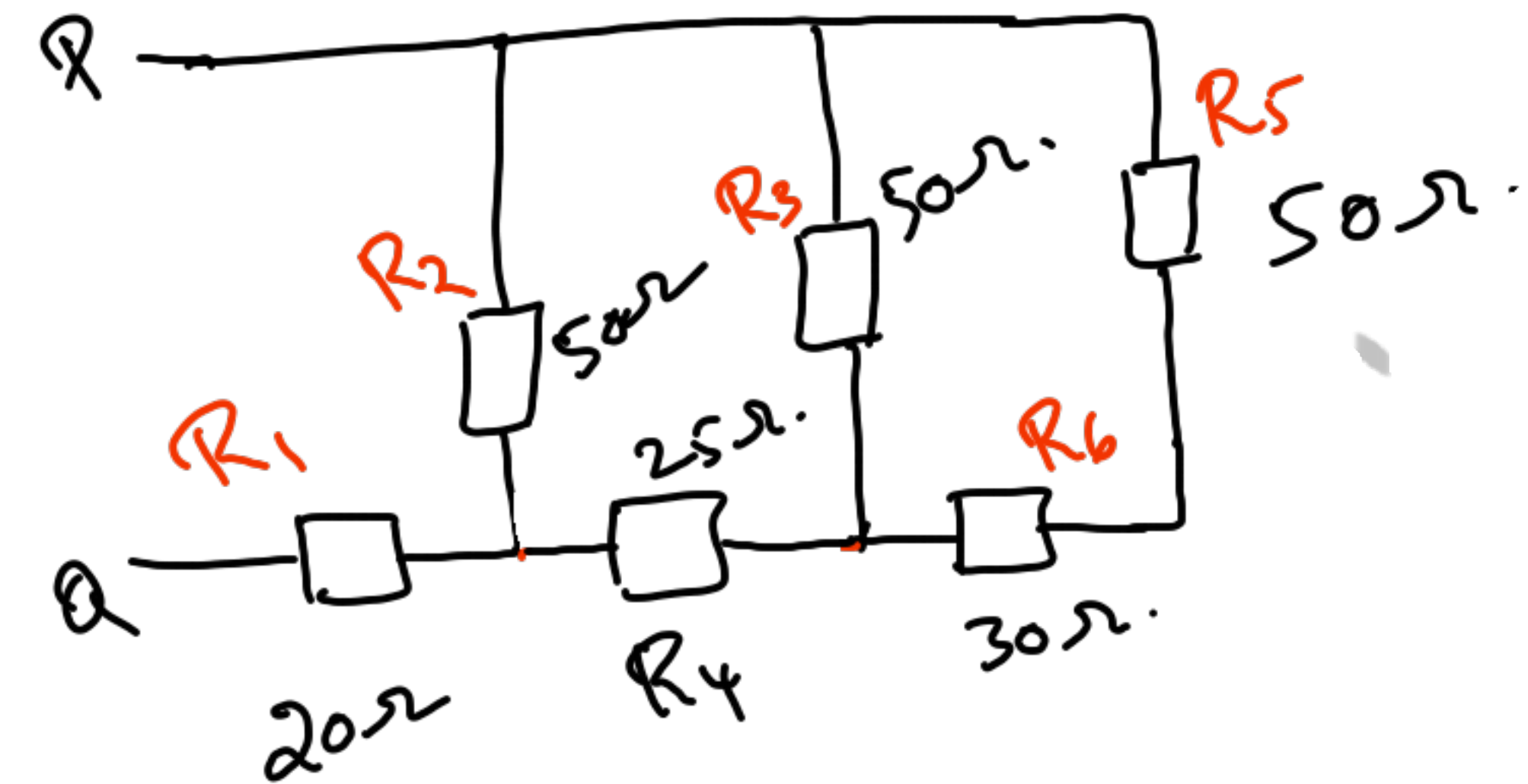
$$R_{eq4} = \frac{1}{0.55} = 1.81 \Omega.$$



$$R_{eq} = 1 + 1.81$$

$$R_{eq} = 2.81 \Omega$$

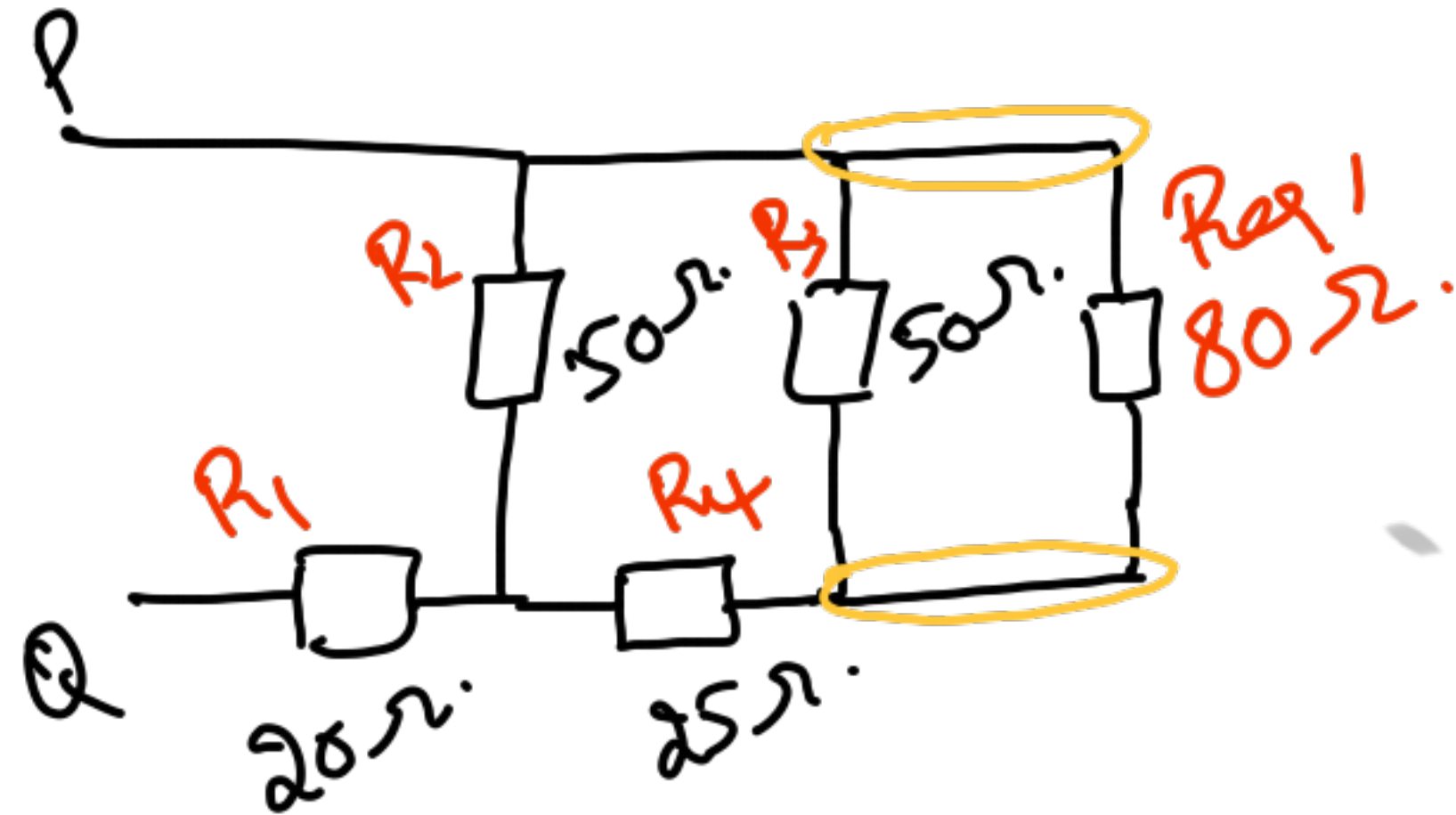
9) Calculate the equivalent Resistance for the following circuit.



R_5 and R_6 are in Series

$$R_{eq1} = R_6 + R_5 = 30 + 50$$

$$R_{eq1} = 80\Omega$$

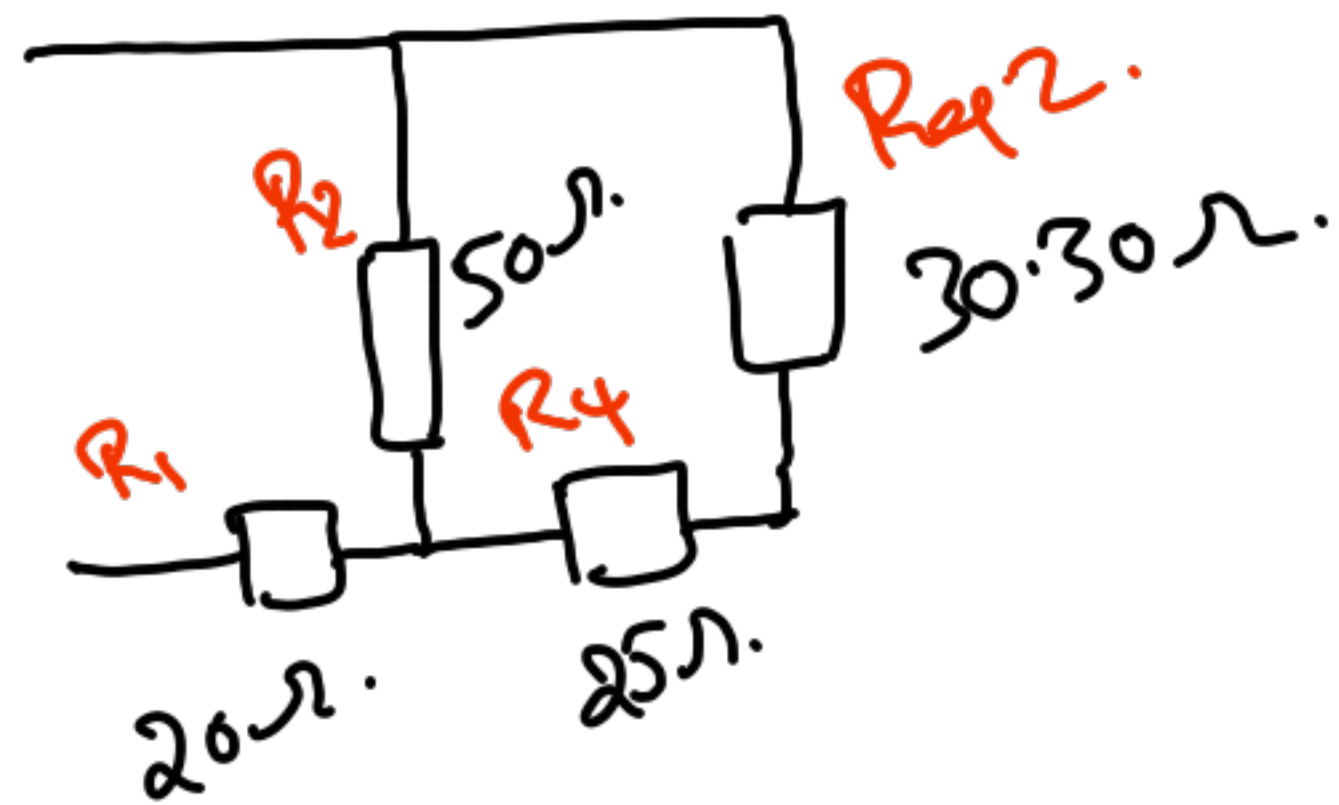


R_3 and R_{eq1} are in Parallel.

$$\frac{1}{R_{eq2}} = \frac{1}{R_3} + \frac{1}{R_{eq1}} = \frac{1}{50} + \frac{1}{80}$$

$$\frac{1}{R_{eq2}} = 0.033$$

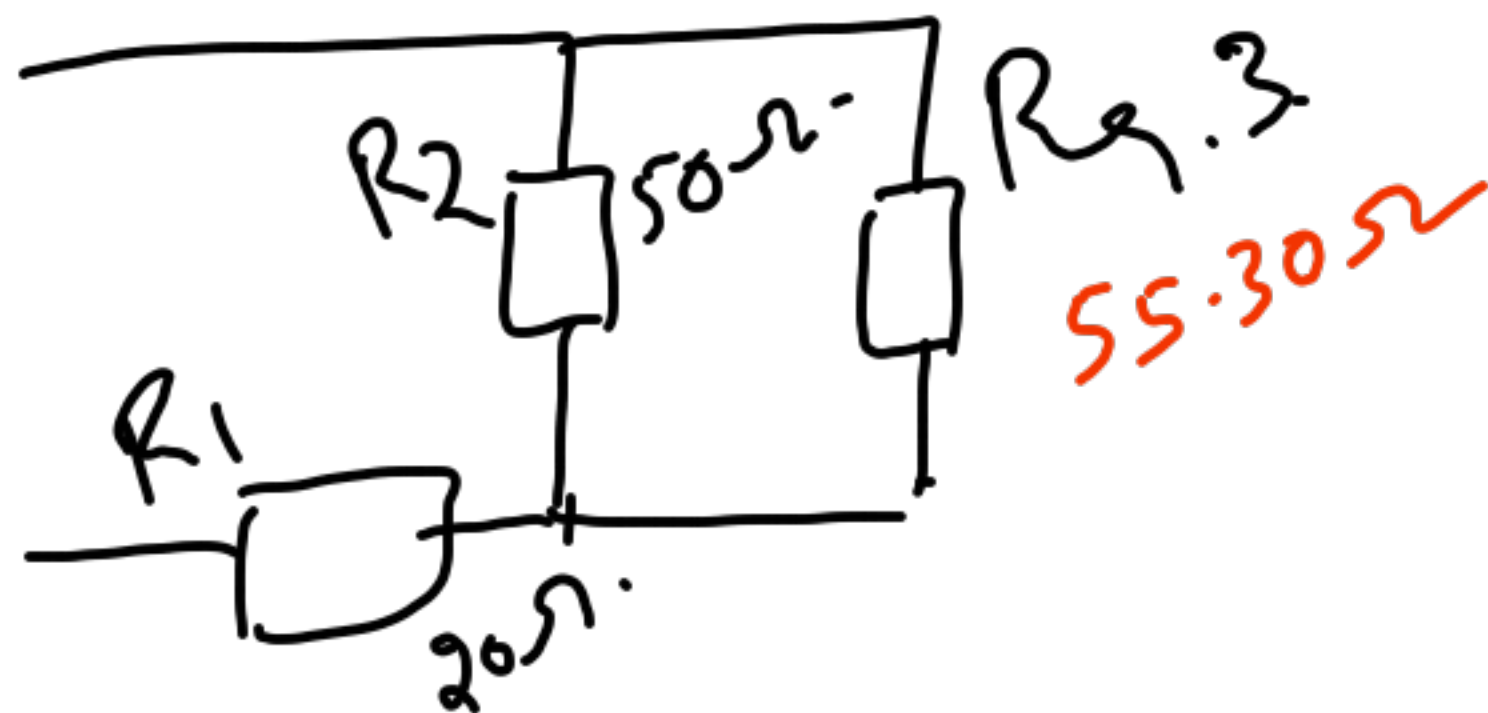
$$R_{eq2} = \frac{1}{0.033} = 30.30\Omega$$



R_4 and R_{eq2} are in series.

$$R_{eq3} = 25 + 30 + 30$$

$$R_{eq3} = 55 + 30 \Omega$$



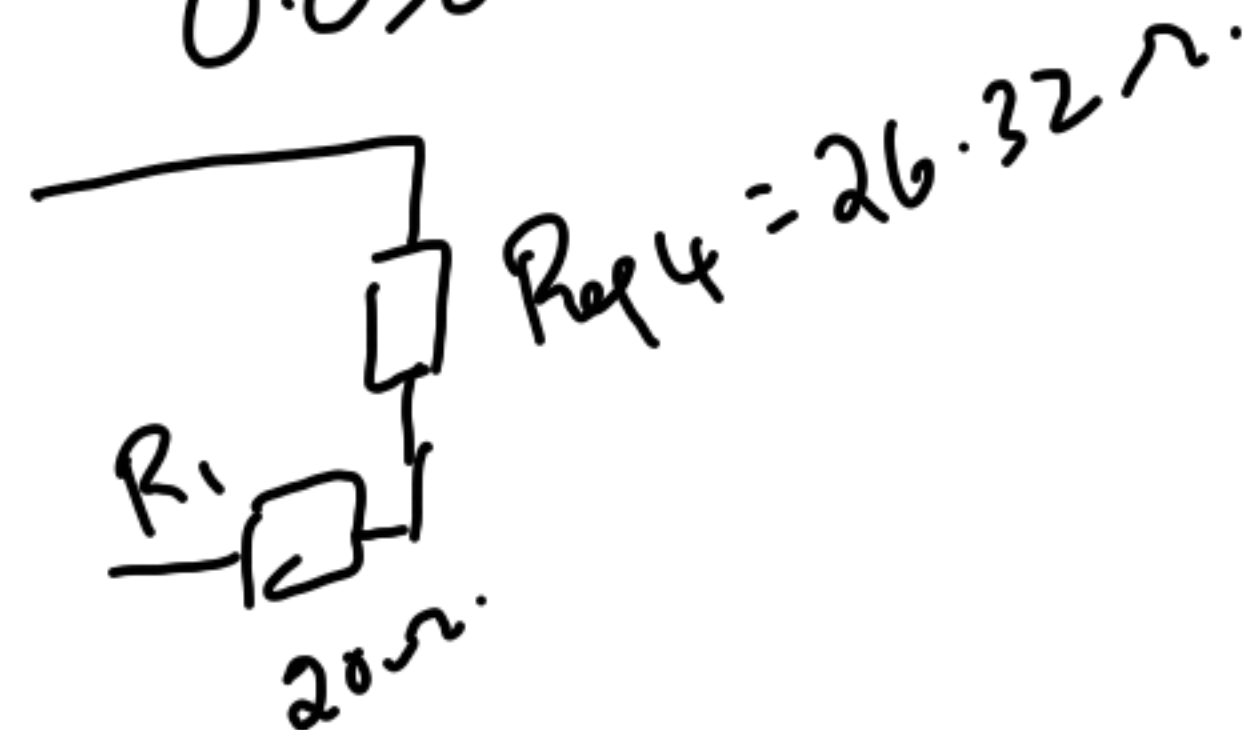
R_2 and R_{eq3} are in Parallel.

$$\frac{1}{R_{eq4}} = \frac{1}{R_2} + \frac{1}{R_{eq3}}$$

$$= \frac{1}{50} + \frac{1}{55 + 30} = 0.038$$

$$\frac{1}{R_{eq4}} = 0.038$$

$$R_{eq4} = \frac{1}{0.038} = 26.32 \Omega$$



$$R_{eq} = 20 + 26.32$$

$$R_{eq} = 46.32 \Omega$$

