

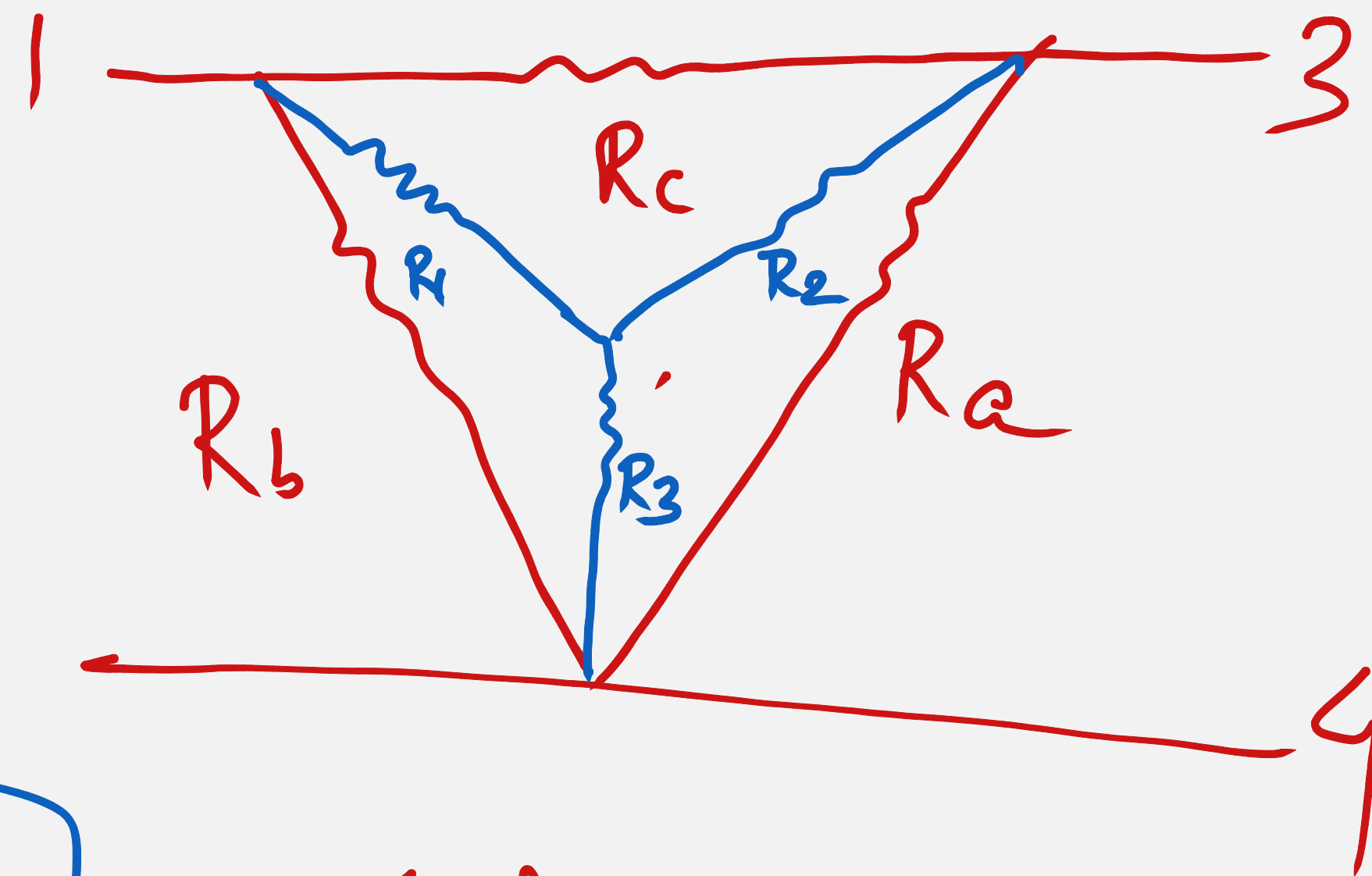
# WHT

## $(\Delta, \nabla)$ Delta to Star Conversion

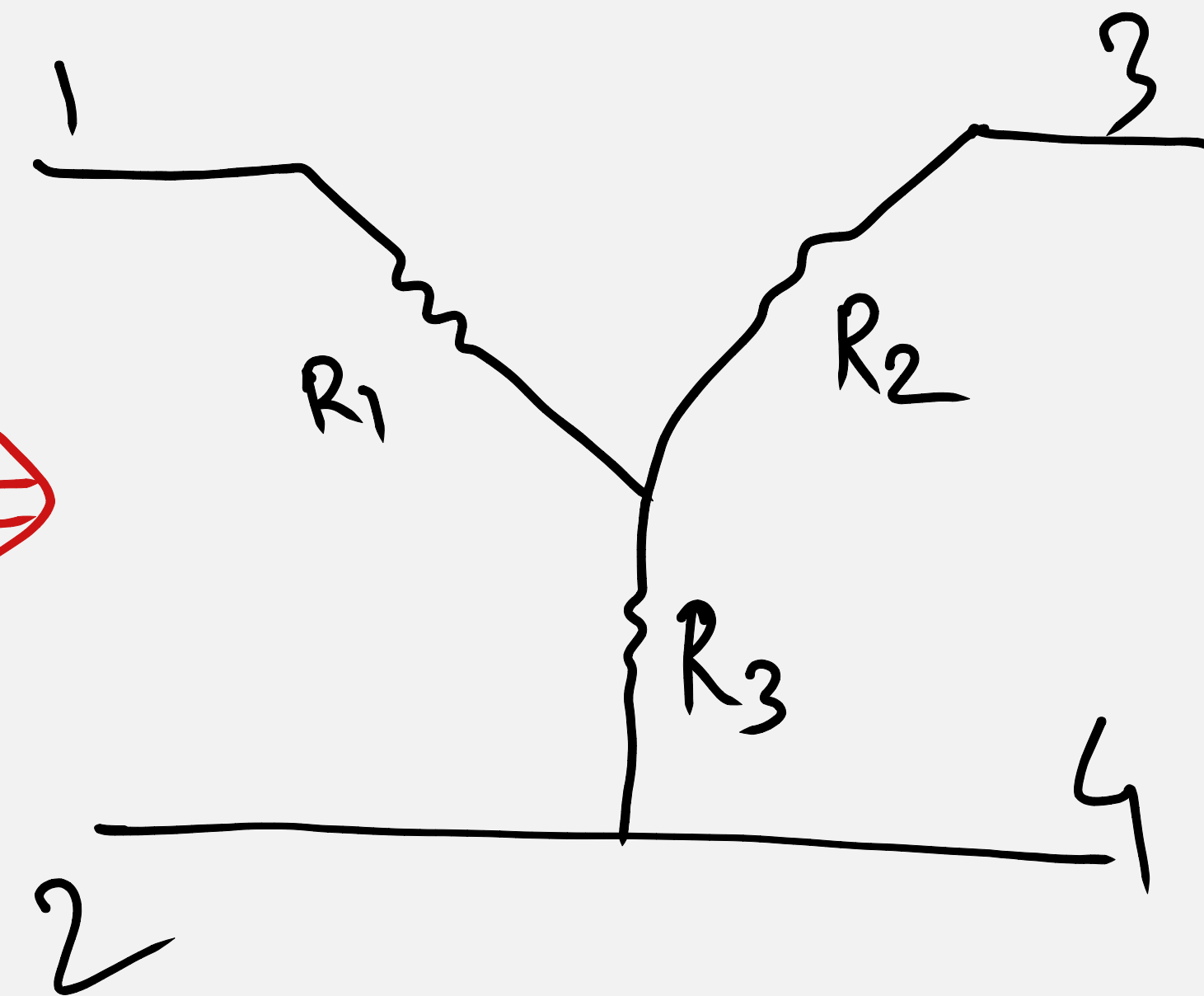
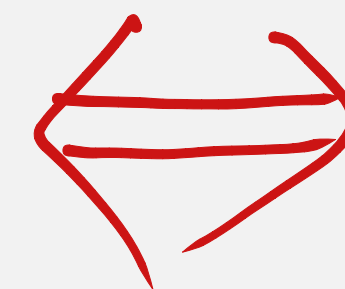
$$R_3 = \frac{R_a R_b}{R_a + R_b + R_c}$$

$$R_1 = \frac{R_b R_c}{R_a + R_b + R_c}$$

$$R_2 = \frac{R_a R_c}{R_a + R_b + R_c}$$



(Δ network)



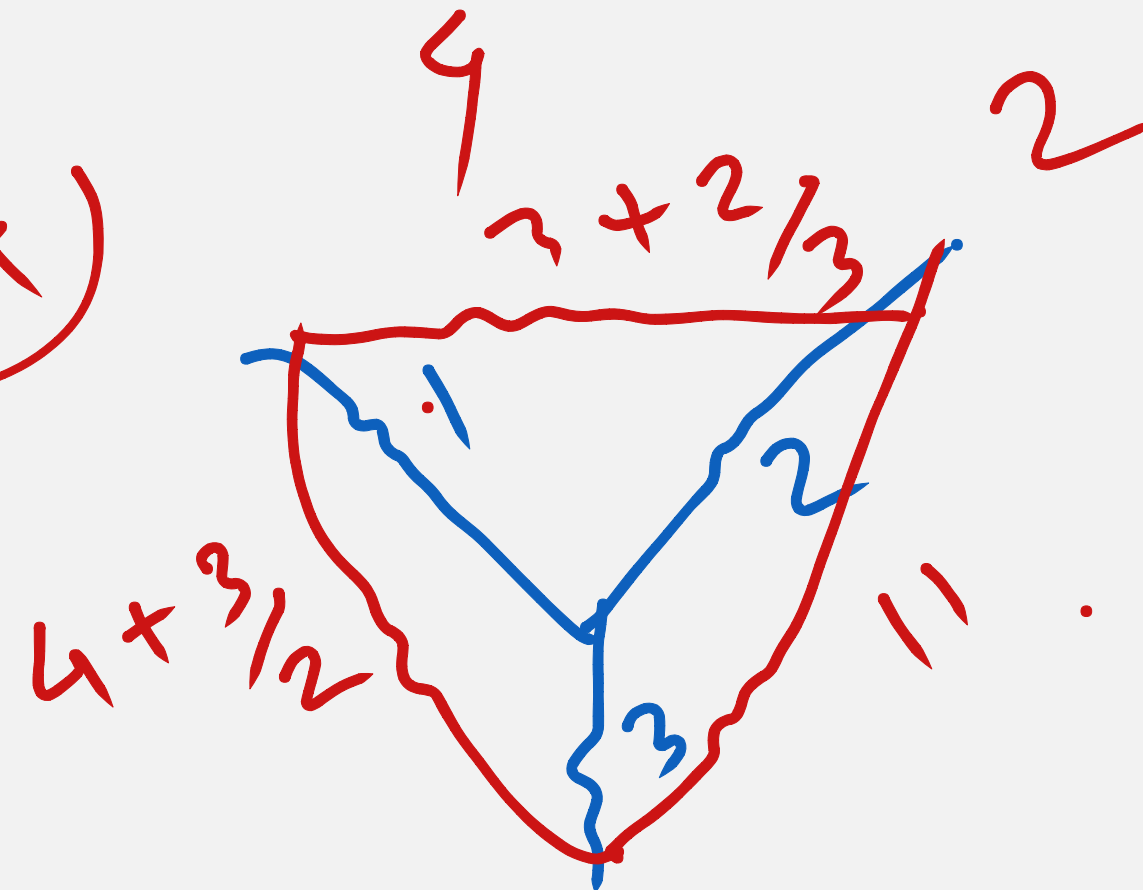
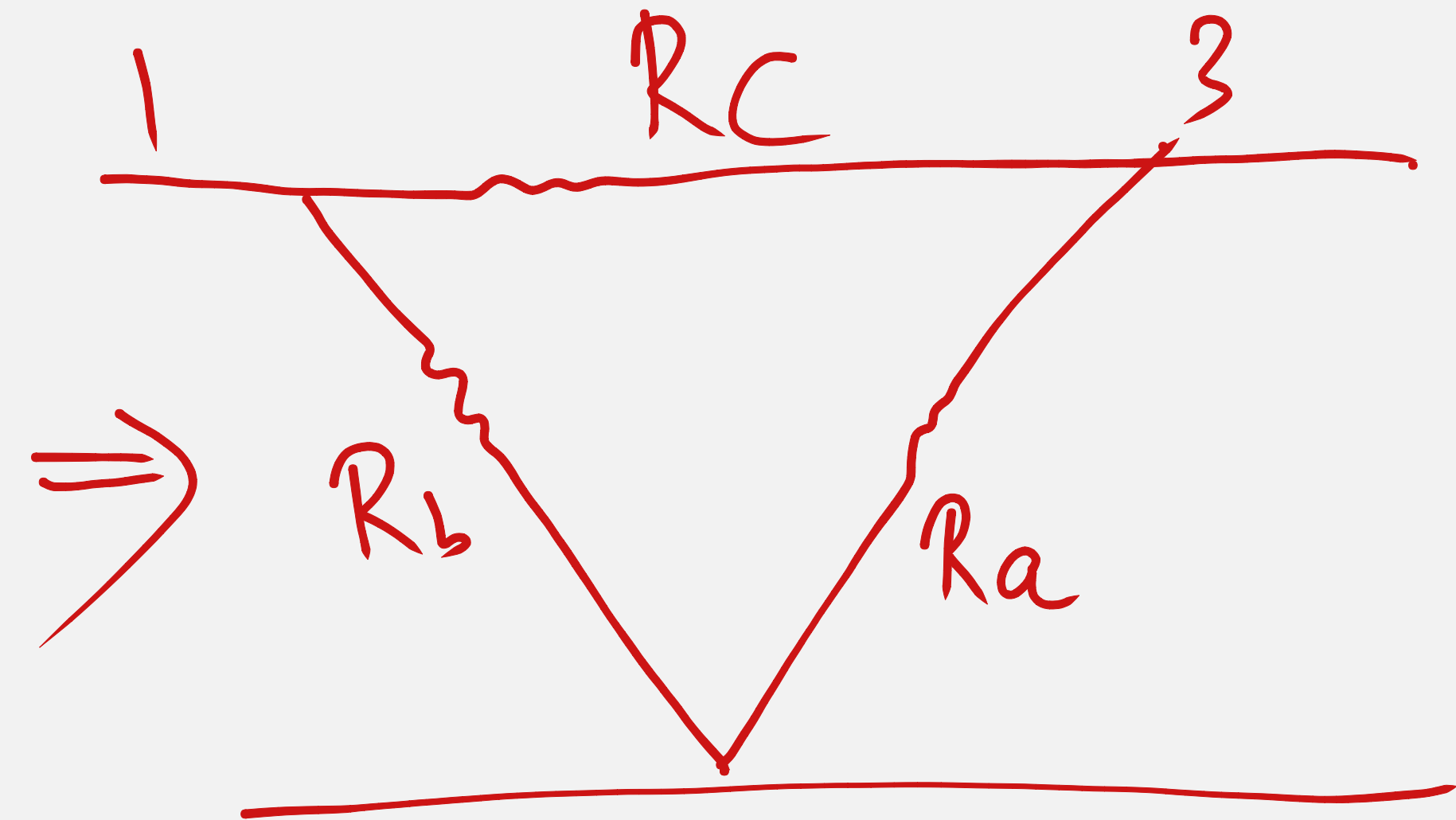
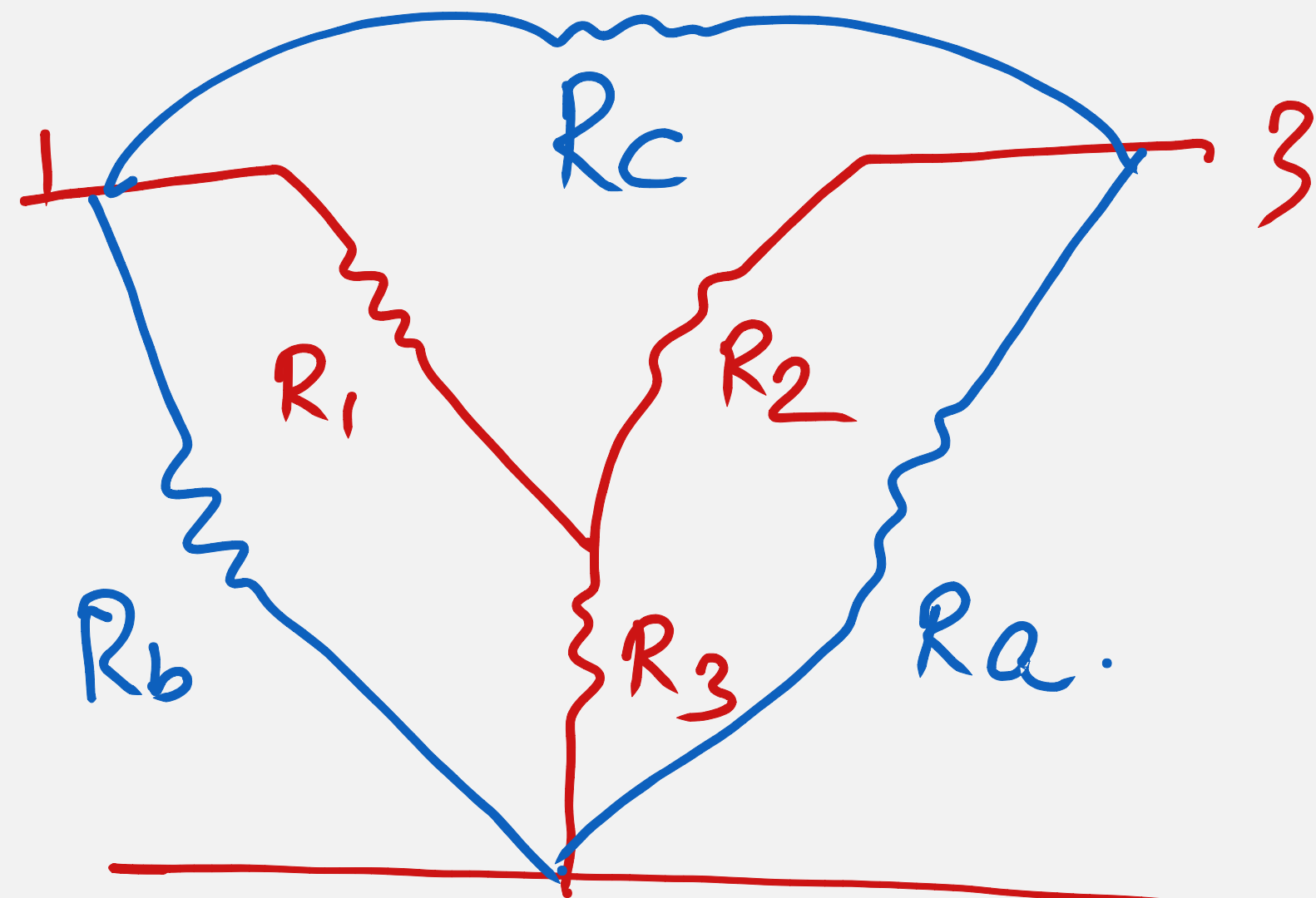
(Y network)

# Star to Delta Conversion

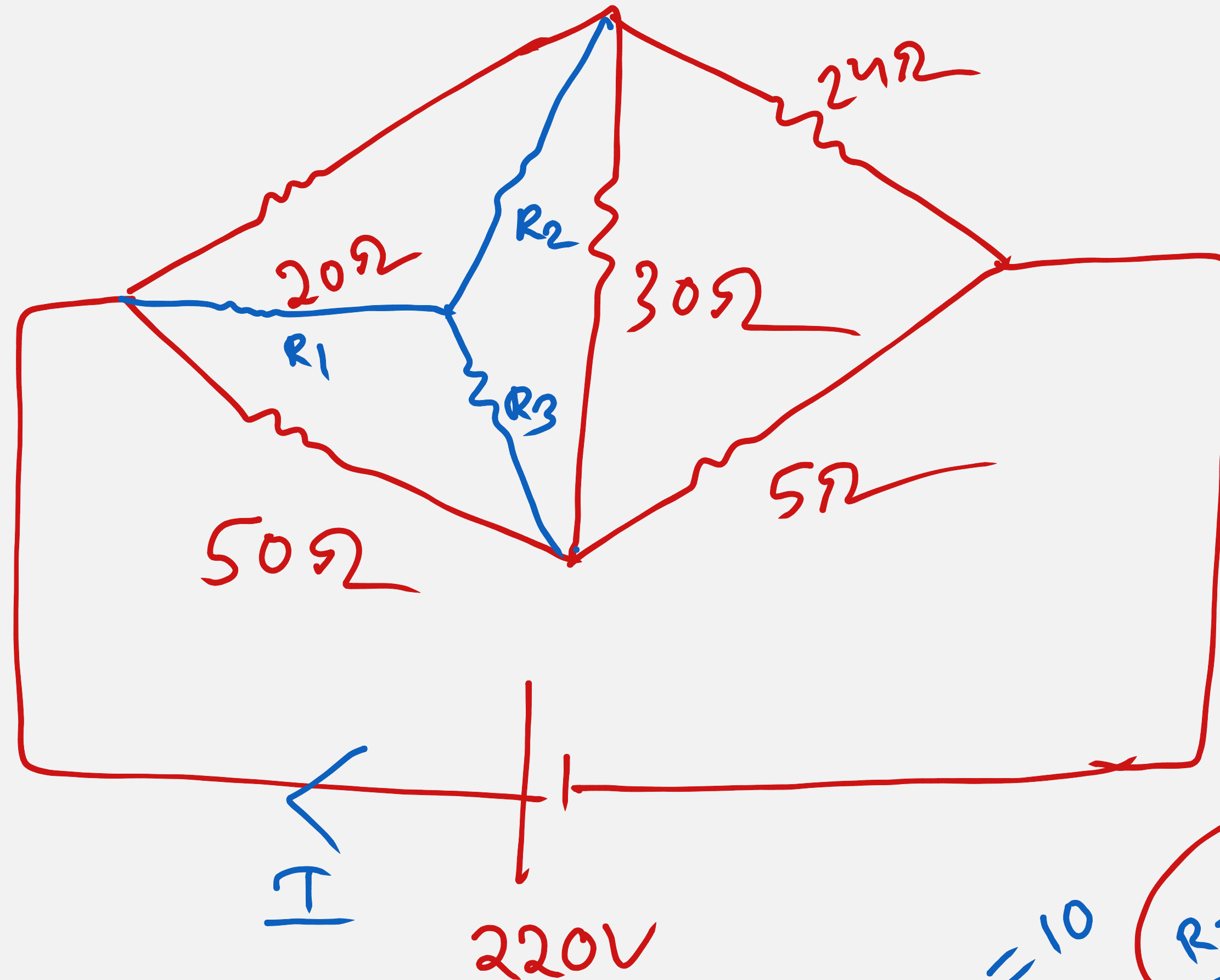
$$R_a = R_2 + R_3 + \frac{R_2 R_3}{R_1}$$

$$R_b = R_1 + R_3 + \frac{R_1 R_3}{R_2}$$

$$R_c = R_1 + R_2 + \frac{R_1 R_2}{R_3}$$



Q. 1.

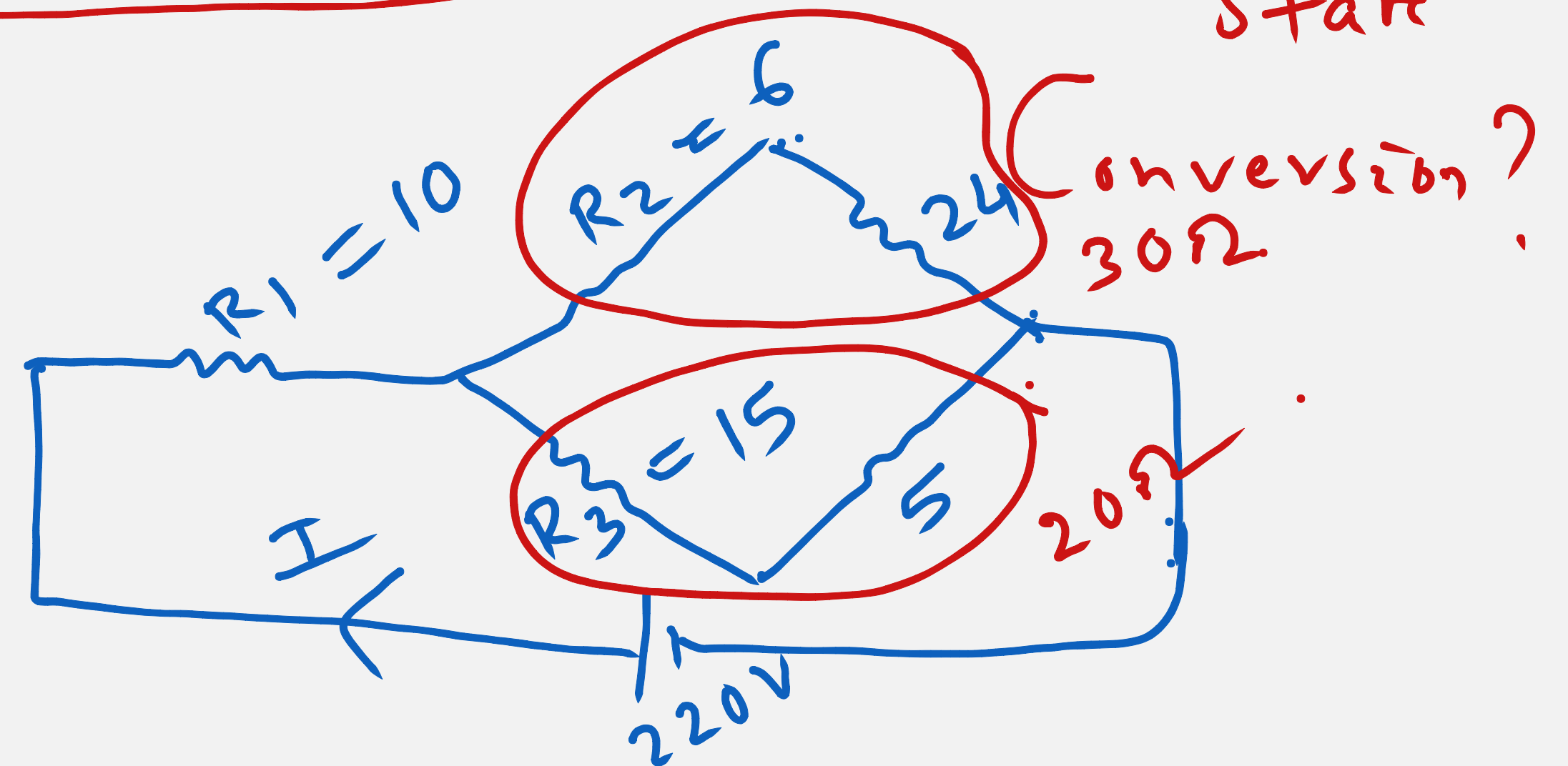


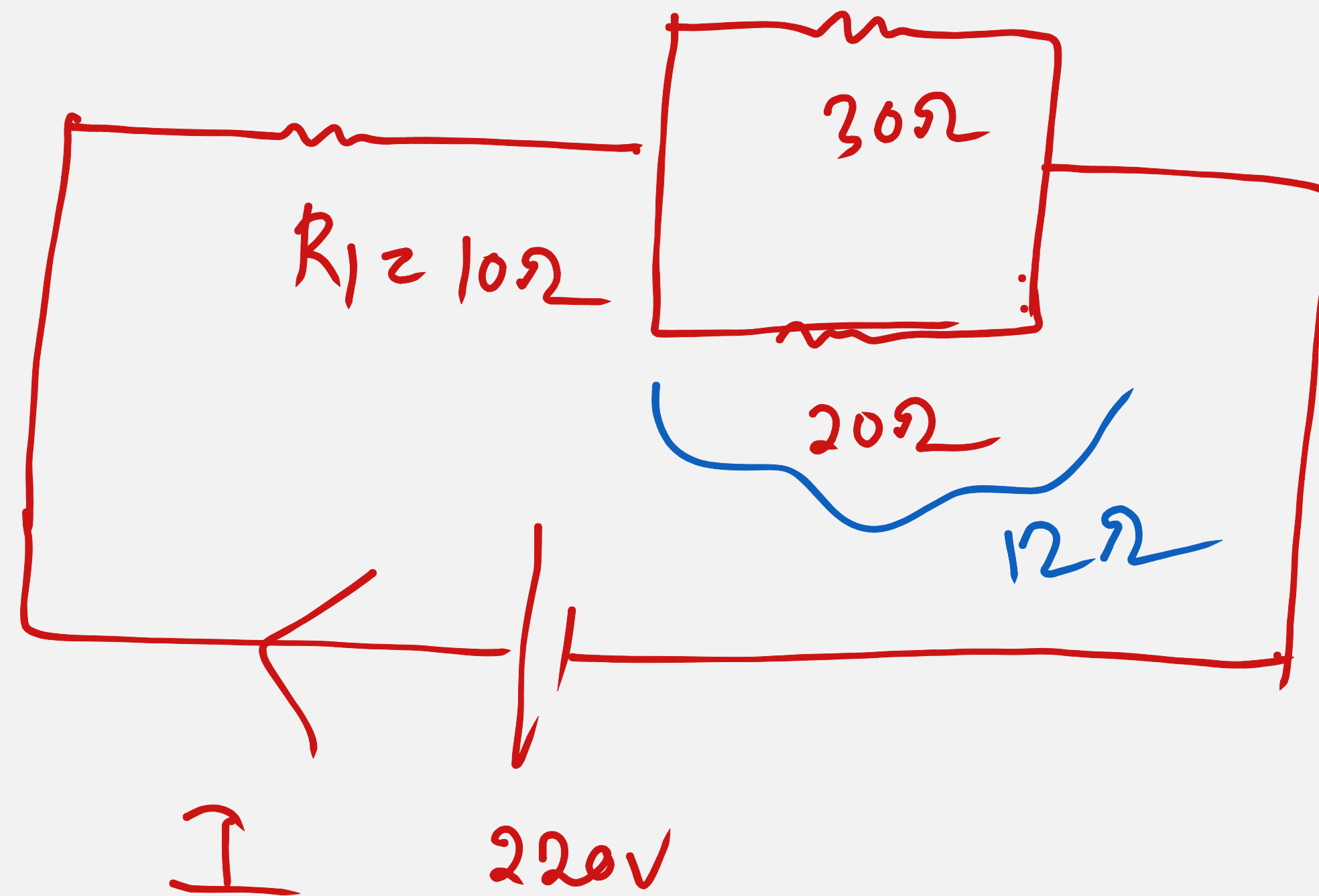
Find  $I$  delivered by the battery using delta to star

$$R_1 = \frac{20 \times 50}{20 + 50 + 30} = 10\Omega$$

$$R_2 = \frac{20 \times 30}{20 + 50 + 30} = 6\Omega$$

$$R_3 = \frac{50 \times 30}{20 + 50 + 30} = 15\Omega$$

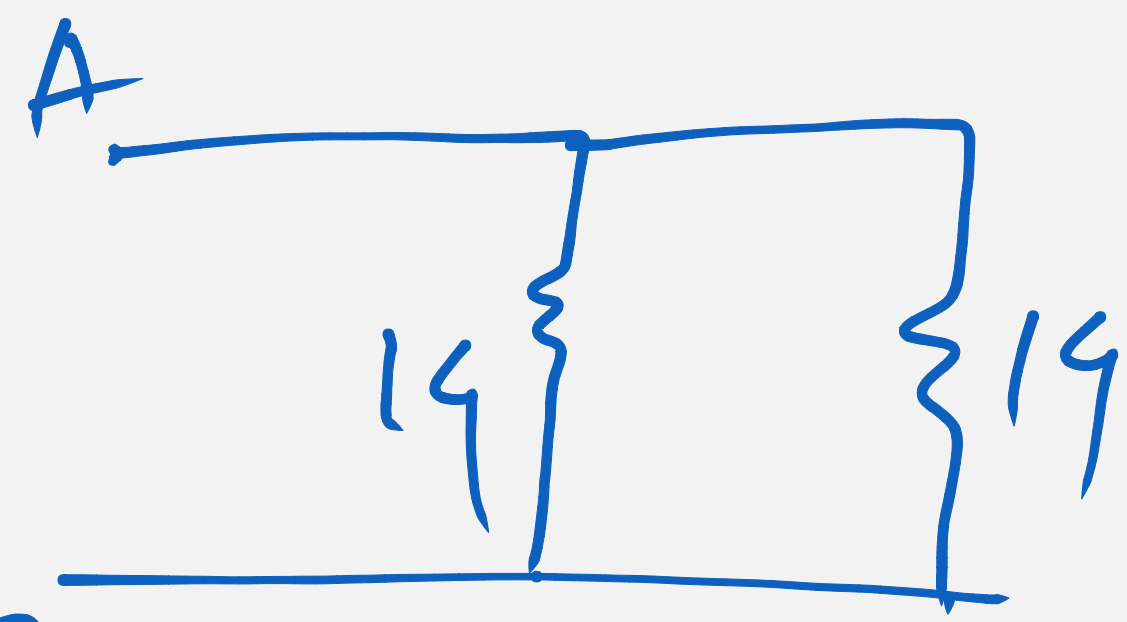




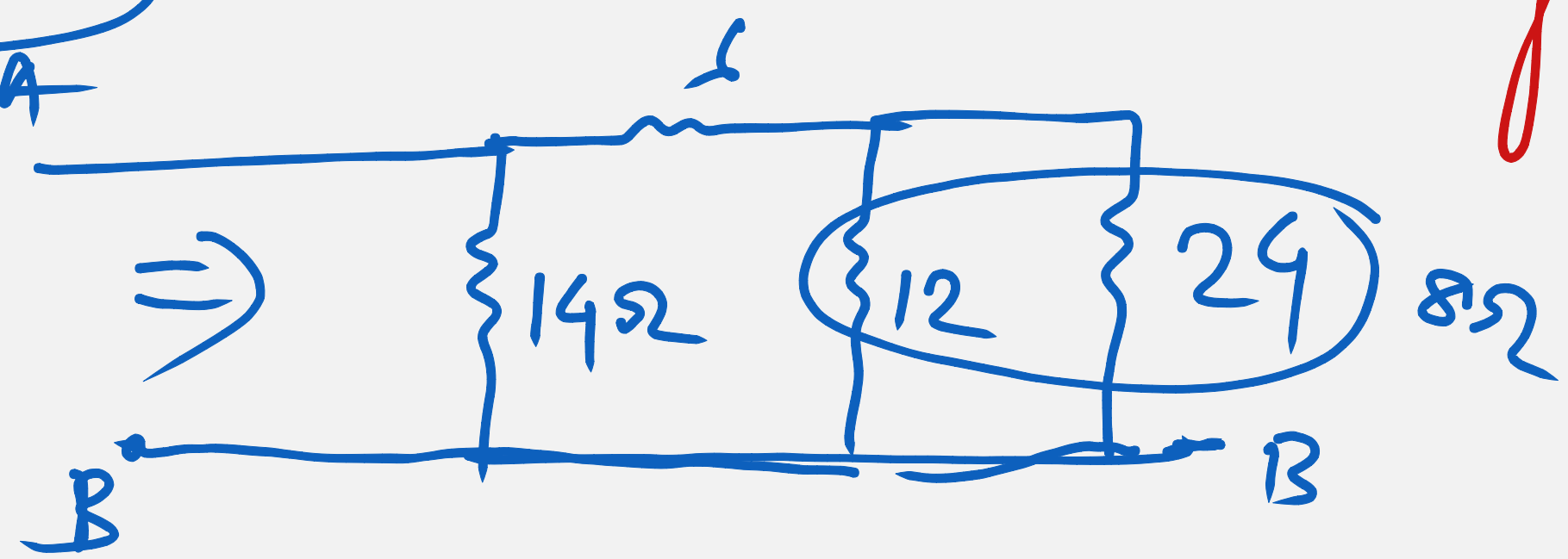
$$\begin{aligned}
 30 \parallel 20 &= \\
 \frac{30 \times 20}{30 + 20} &= \frac{600}{50} \\
 &= 12\Omega
 \end{aligned}$$

$$I = \frac{220}{10 + 12} = 10A$$

Q.2



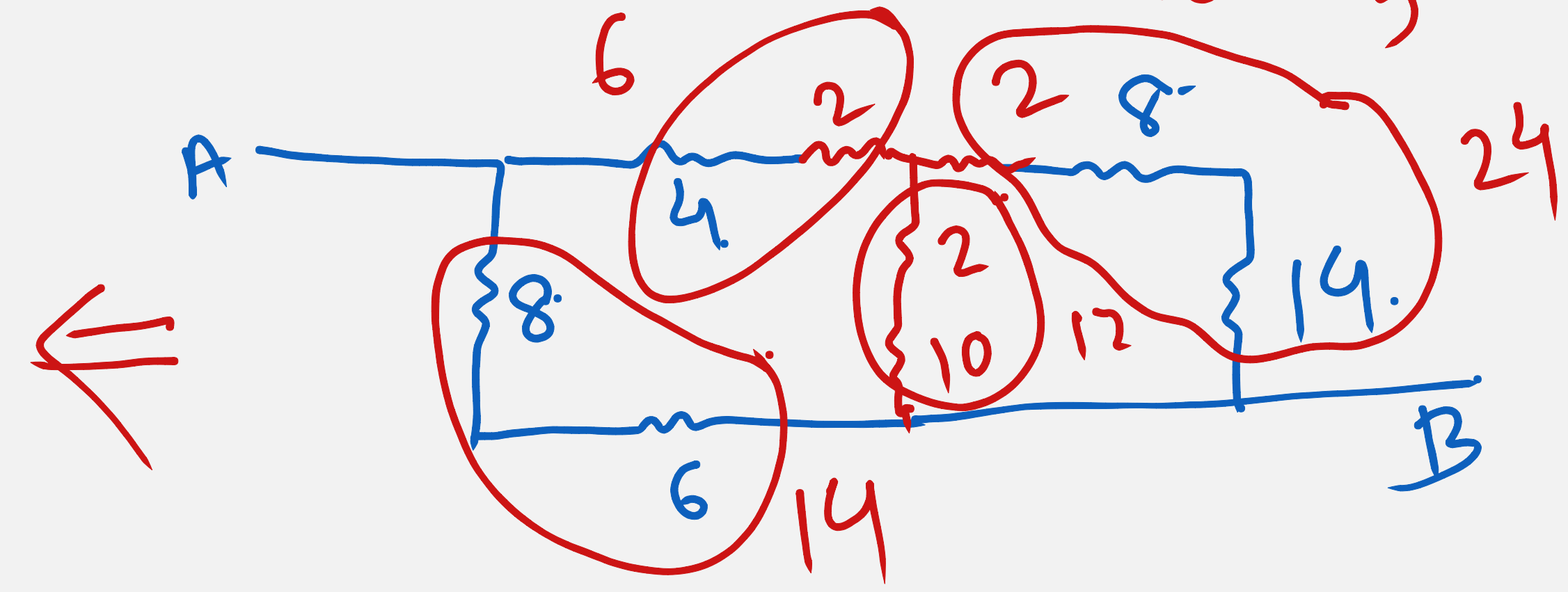
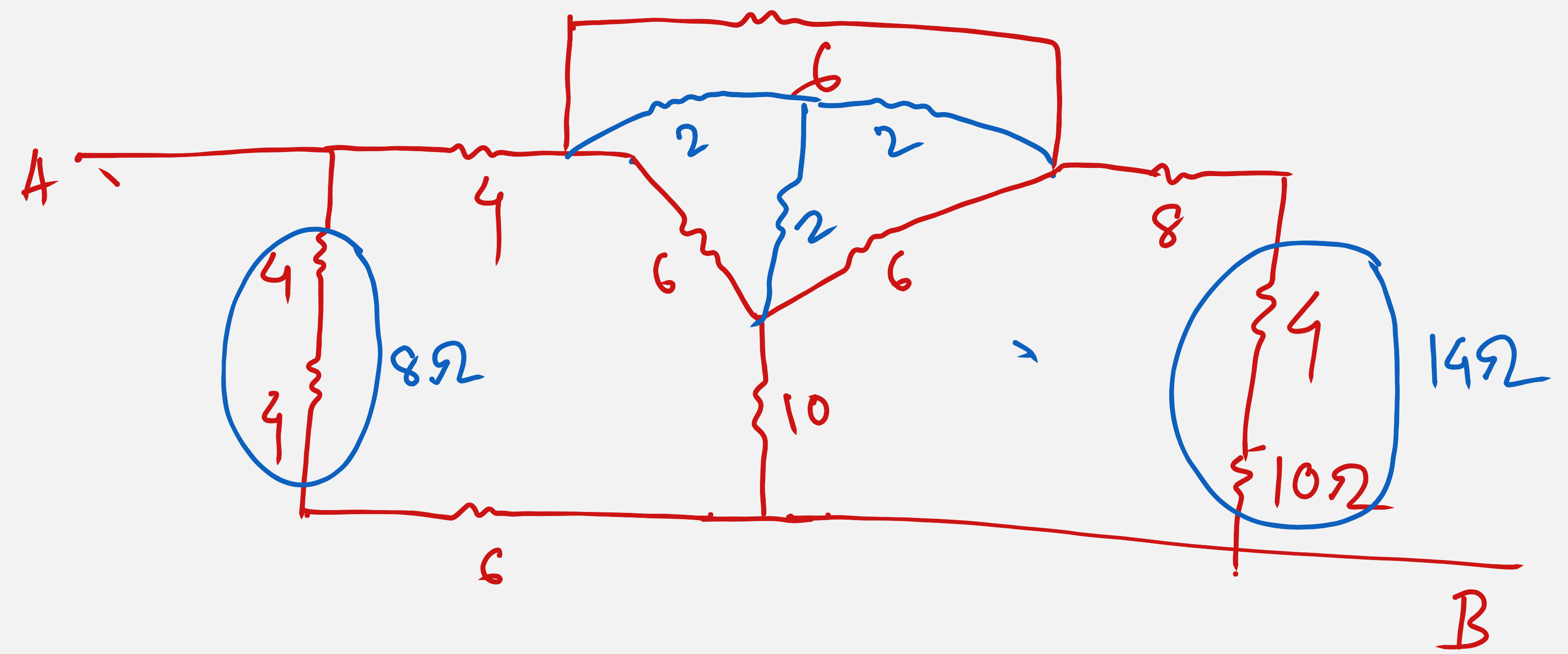
$R_{AB} = 7\Omega$



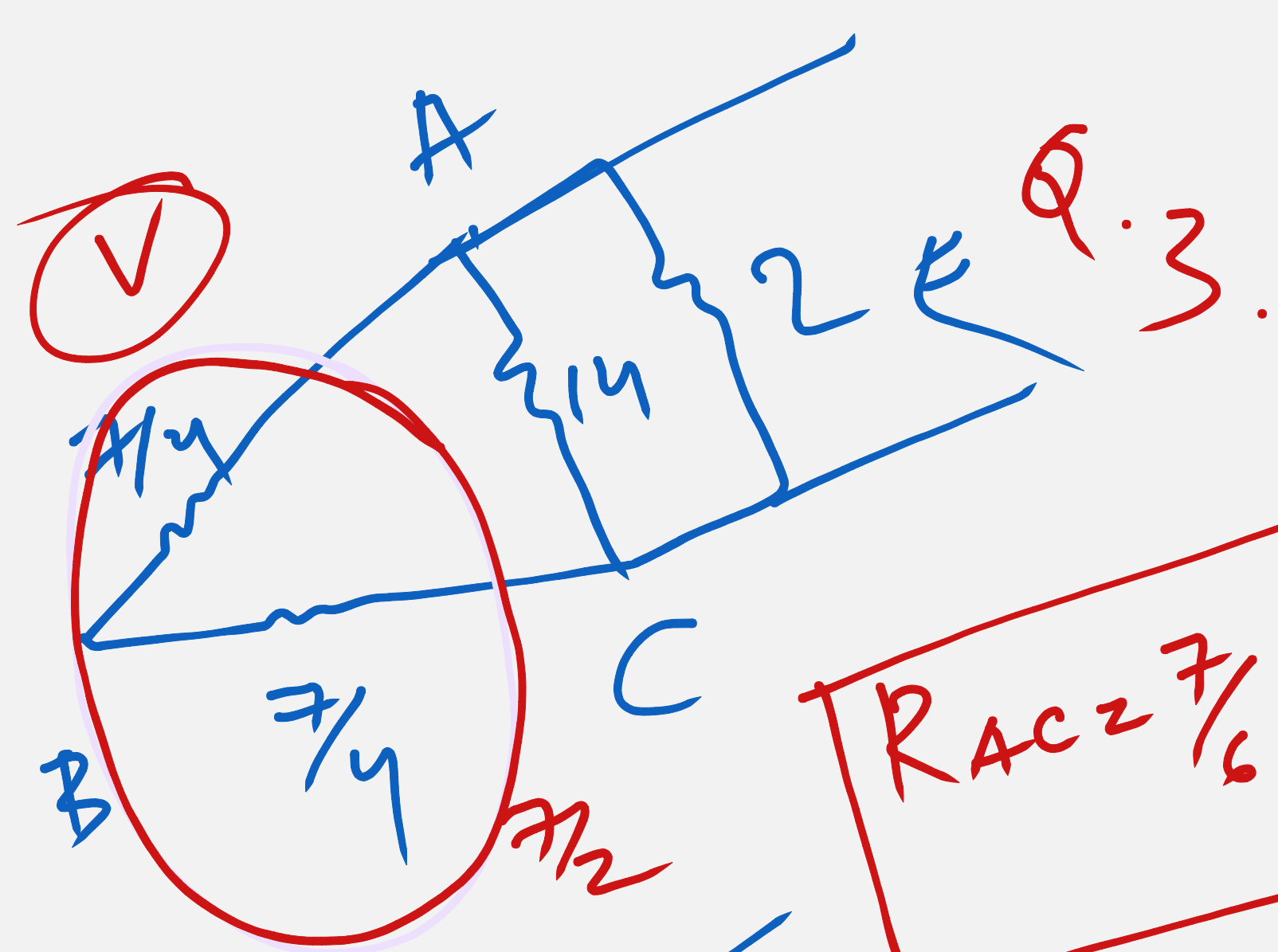
Find  $R_{AB}$  using

delta to star

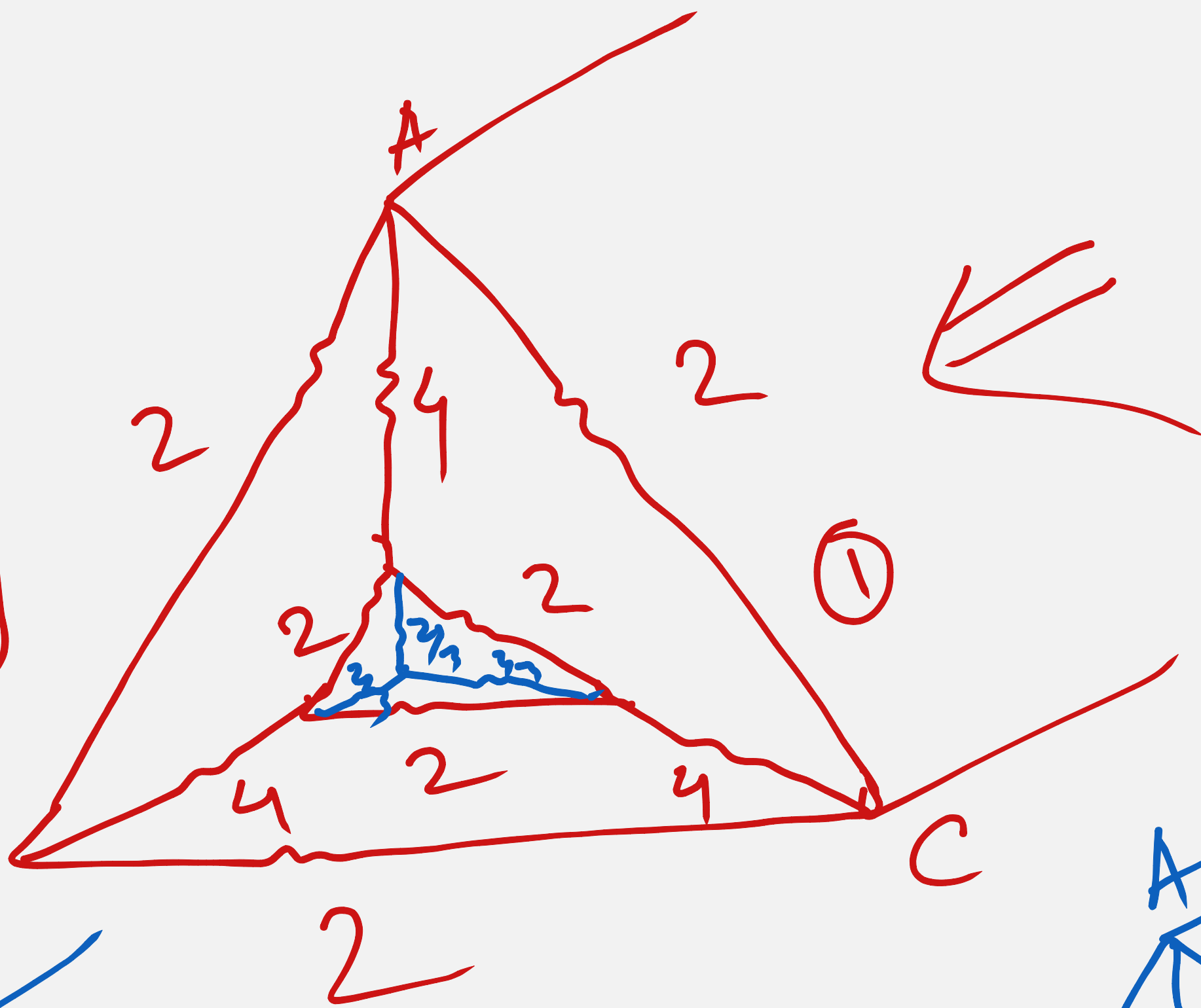
Conversion



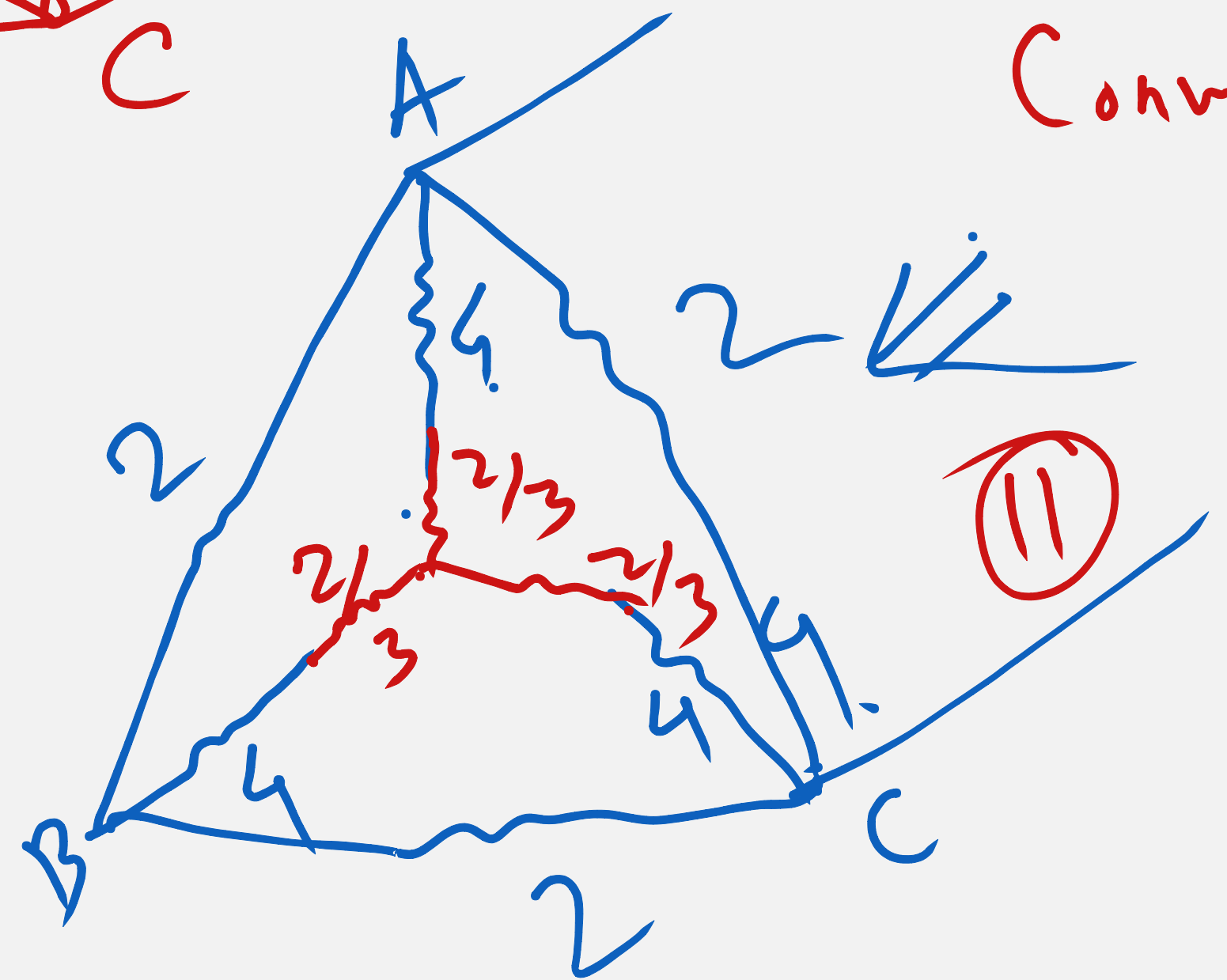
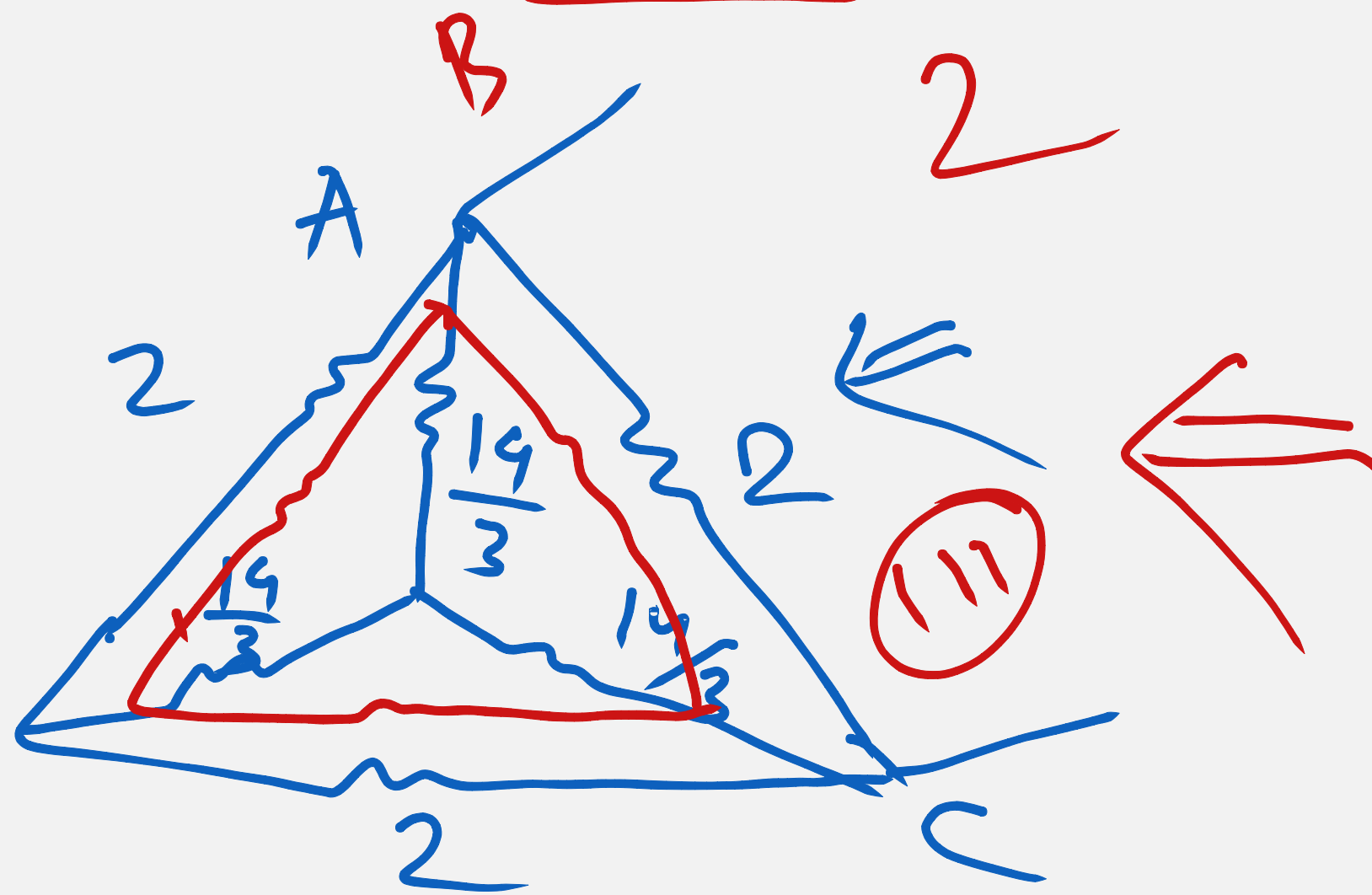
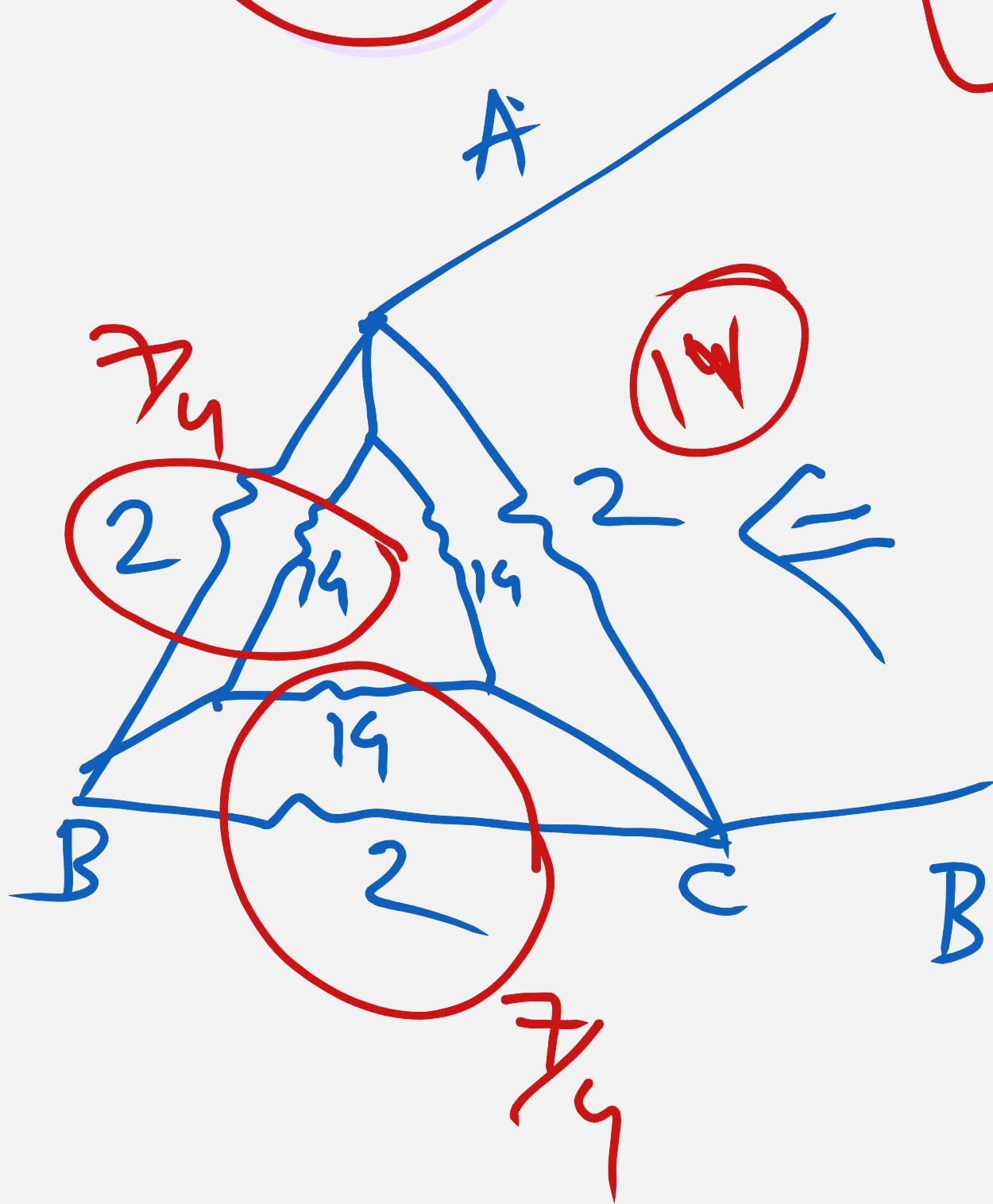




$R_{AC} = \frac{7}{6} \Omega$

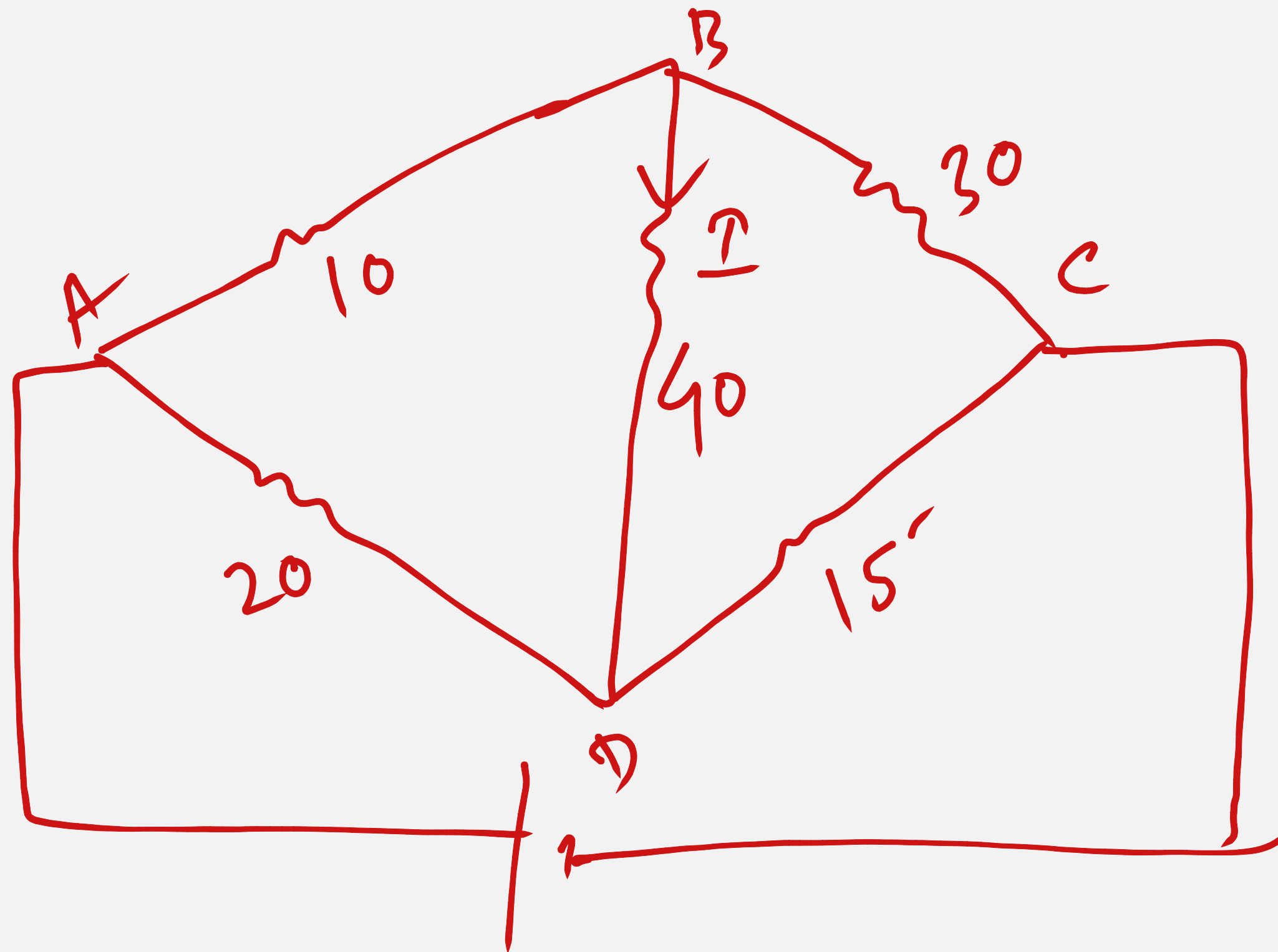


$R_{AC} = ?$   
 using delta to Star Conversion



H.W

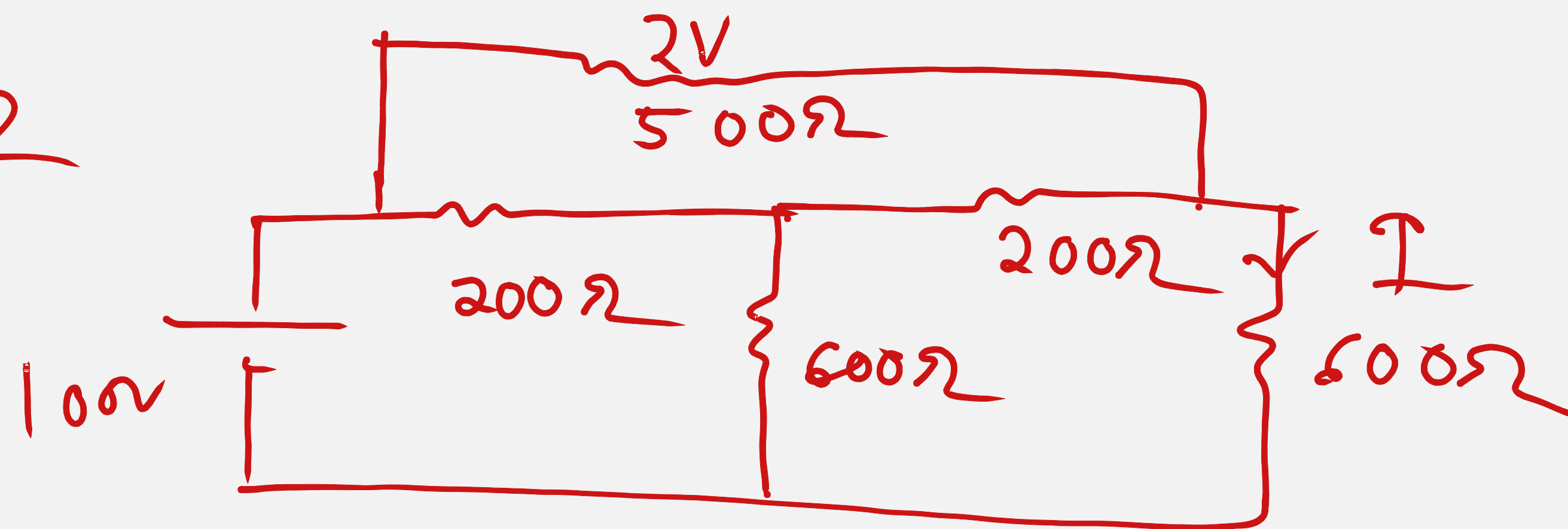
Q.1.



Find  $I_{40\Omega}$

using delta  
+  
star

Q.2



Conversion  
Determine  $I$   
= ?

