



COMBINING RESISTANCE

What is the total resistance? Show work! Draw the diagrams step-by-step!

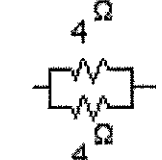
1.


 $R_{tot} = R_1 + R_2 = 2 + 4 = \boxed{6\Omega}$

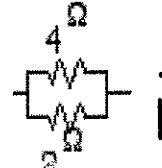
2.


 $R_{tot} = R_1 + R_2 = 4 + 6 = \boxed{10\Omega}$

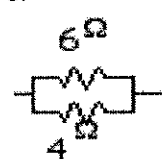
3.


 $\frac{1}{R_{tot}} = \frac{1}{R_1} + \frac{1}{R_2} \rightarrow \frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2} \rightarrow \boxed{2\Omega}$

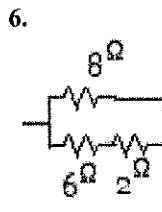
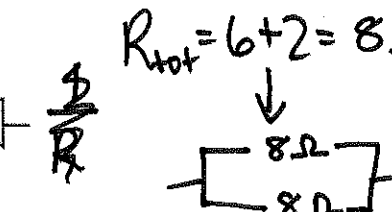
4.


 $\frac{1}{R_{tot}} = \frac{1}{R_1} + \frac{1}{R_2} \rightarrow \frac{1}{4} + \frac{1}{2 \cdot 4} \rightarrow \frac{1}{4} + \frac{1}{8} = \frac{2}{8} + \frac{1}{8} = \frac{3}{8} \rightarrow \boxed{\frac{8}{3}\Omega}$

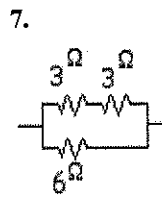
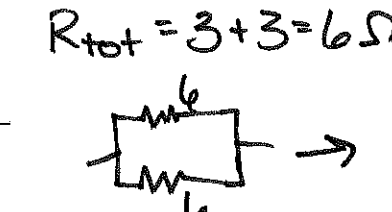
5.


 $\frac{1}{R_{tot}} = \frac{1}{6} + \frac{1}{4 \cdot 3} = \frac{1}{6} + \frac{1}{12} = \frac{2}{12} + \frac{1}{12} = \frac{3}{12} = \frac{1}{4} \rightarrow \boxed{4\Omega}$

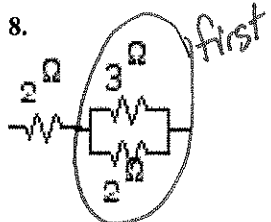
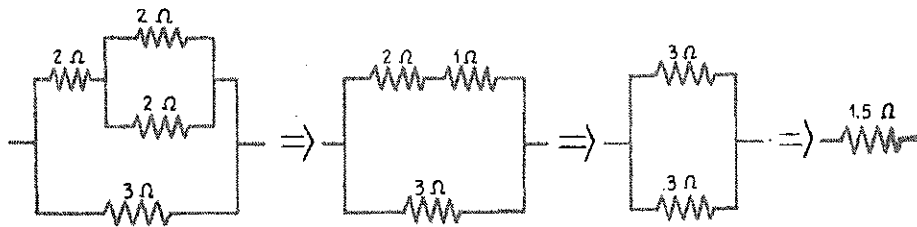
6.


 $R_{tot} = 6 + 2 = 8\Omega$

 $\rightarrow \frac{1}{R_{tot}} = \frac{1}{8} + \frac{1}{8} = \frac{2}{8} = \frac{1}{4} \rightarrow \boxed{4\Omega}$

7.

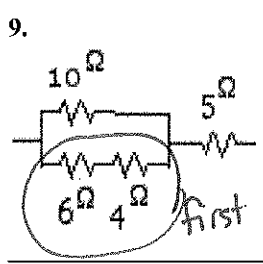

 $R_{tot} = 3 + 3 = 6\Omega$

 $\rightarrow \frac{1}{R_{tot}} = \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3} \rightarrow \boxed{3\Omega}$

Example:



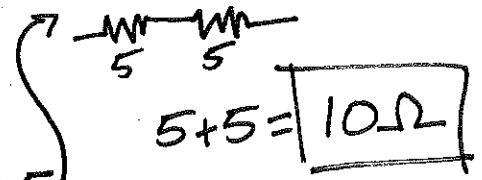
$$\frac{1}{R_{tot}} = \frac{1}{3 \cdot 2} + \frac{1}{2 \cdot 3} = \frac{2}{6} + \frac{3}{6} = \frac{5}{6} \Rightarrow \boxed{\frac{6}{5}} \Rightarrow \frac{6}{5} \Omega$$

$$2 + \frac{6}{5} = \boxed{3.2 \Omega}$$

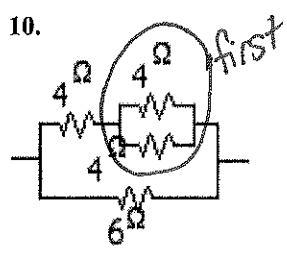


$$6 + 4 = 10 \Omega$$

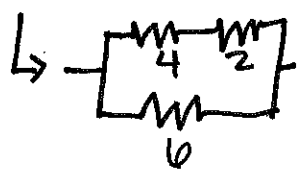
$$\frac{1}{10} + \frac{1}{10} = \frac{2}{10} = \frac{1}{5} \Rightarrow 5$$



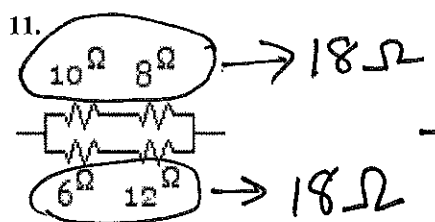
$$5 + 5 = \boxed{10 \Omega}$$



$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2} \Rightarrow 2$$



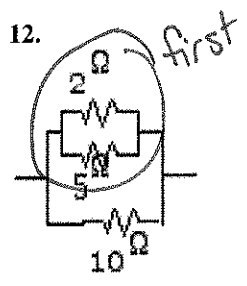
$$4 + 2 = 6 \Rightarrow \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3} \Rightarrow \boxed{3 \Omega}$$



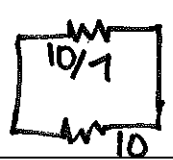
$$10 + 8 = 18 \Omega$$

$$6 + 12 = 18 \Omega$$

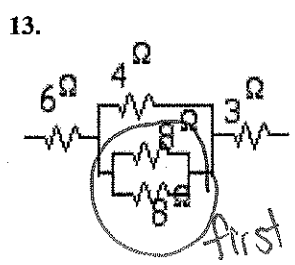
$$\frac{1}{18} + \frac{1}{18} = \frac{2}{18} = \frac{1}{9} \Rightarrow \boxed{9 \Omega}$$



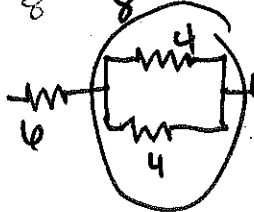
$$\frac{1}{2 \cdot 5} + \frac{1}{5 \cdot 2} = \frac{1}{10} + \frac{1}{10} = \frac{2}{10} = \frac{1}{5} \Rightarrow 5$$



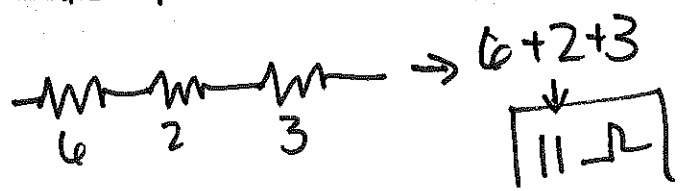
$$\frac{1}{10} + \frac{1}{5} = \frac{1}{10} + \frac{2}{10} = \frac{3}{10} \Rightarrow \frac{10}{3} \Rightarrow \boxed{\frac{5}{4} \Omega}$$



$$\frac{1}{8} + \frac{1}{8} = \frac{2}{8} = \frac{1}{4} \Rightarrow 4$$



$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2} \Rightarrow 2$$



$$6 + 2 + 3 = 11 \Rightarrow \boxed{11 \Omega}$$