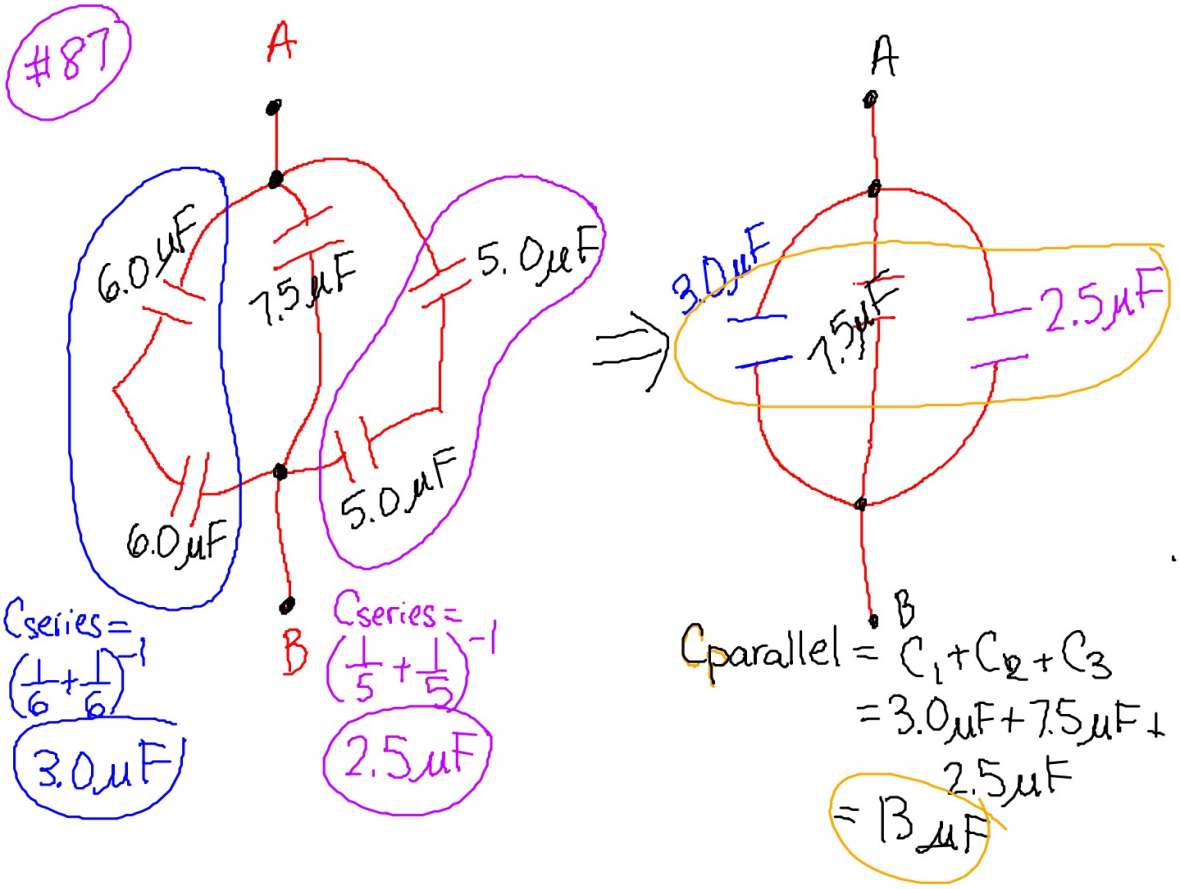
#87



$C_{series} = \left(\frac{1}{6}+\frac{1}{6}\right)^{-1}$

3.0 μF

$C_{series} = \left(\frac{1}{5}+\frac{1}{5}\right)^{-1}$

2.5 μF

$C_{parallel} = C_1 + C_2 + C_3$

$= 3.0\,\mu F + 7.5\,\mu F + 2.5\,\mu F$

$= 13\,\mu F$

Energy in Capacitors

$$PE_E = \frac{1}{2}QV = \frac{1}{2}CVV = \frac{1}{2}CV^2 = \frac{1}{2}C\frac{Q^2}{C^2} = \frac{1}{2}\frac{Q^2}{C}$$

$Q = CV$ $\qquad V = \frac{Q}{C}$

#95

$$\frac{1}{2}CV^2 = \frac{1}{2}(20.0\times10^{-6}\,F)(12.0\,V)^2 = 1.44\times10^{-3}\,J \text{ or } 1.44\,mJ$$

#96

$$\frac{1}{2}QV = \frac{1}{2}(20.0\times10^{-6}\,C)(9.0\,V) = 9.0\times10^{-5}\,J \text{ or } 90\,\mu J$$

#97

$$\frac{1}{2}\frac{Q^2}{C} = \frac{1}{2}\frac{(40.0\,\mu C)^2}{(80.0\,\mu F)} = 1.0\times10^{-5}\,J \text{ or } 10\,\mu J$$

#98

$PE_E = 2.00\,J$

$C = 10.0\,\mu F$

$V = \_\_\_ V$

$PE_E = \frac{1}{2}CV^2 \Longrightarrow V = \sqrt{\frac{2PE_E}{C}}$

$2.00\,J = \frac{1}{2}(10.0\,\mu F)V^2$

$V = 632\,V$