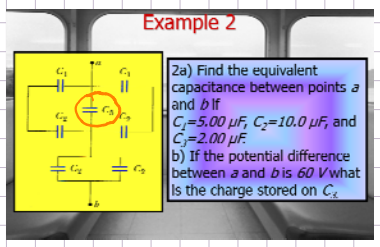
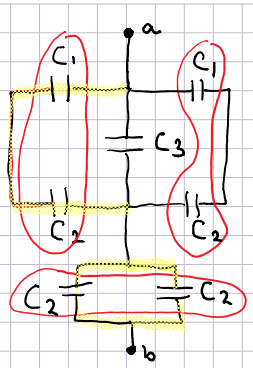
Example 2

Wednesday, March 5, 2014 7:47 AM

$q = CV$





$\frac{1}{C_{12}} = \frac{1}{C_1} + \frac{1}{C_2}$

$\frac{1}{C_{12}} = \frac{1}{5\mu F} + \frac{1}{10\mu F}$

$\frac{1}{C_{12}} = \frac{2}{10\mu F} + \frac{1}{10\mu F}$

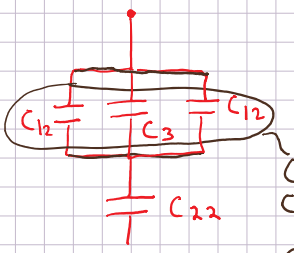
$\frac{1}{C_{12}} = \frac{3}{10\mu F}$

$C_{12} = \frac{10}{3}\mu F$

$C_{22} = C_2 + C_2$

$C_{22} = 10\mu F + 10\mu F$

$C_{22} = 20\mu F$

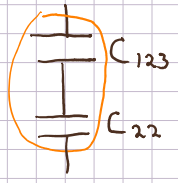


$C_{123} = C_{12} + C_{12} + C_3$

$C_{123} = \frac{10}{3}\mu F + \frac{10}{3}\mu F + 2\mu F$

$C_{123} = \frac{20}{3}\mu F + \frac{6}{3}\mu F = \frac{26}{3}\mu F$

$C_{123} = 8.67\mu F$

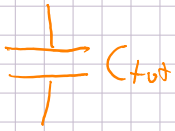


$\frac{1}{C_{tot}} = \frac{1}{C_{123}} + \frac{1}{C_{22}}$

$\frac{1}{C_{tot}} = \frac{1}{8.67\mu F} + \frac{1}{20\mu F}$

$\frac{1}{C_{tot}} = .165/\mu F$

$C_{tot} = 6.05\mu F$



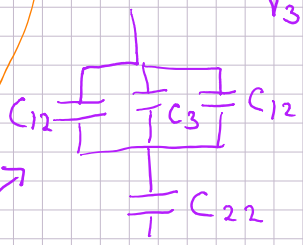
$V_3 = V_{123} = \frac{q_{123}}{C_{123}} = \frac{363\mu C}{8.67\mu F}$

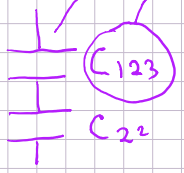
$V_3 = 41.9V$

$q_3 = C_3 V_3$

$q_3 = (2\mu F)(41.9V)$

$q_3 = 83.7\mu C$





$q_{123} = q_{22} = q_{tot}$

$q_{tot} = V_{tot} C_{tot}$

$q_{tot} = (60V)(6.05\mu F)$

$q_{tot} = 363\mu C$

$V_{tot} = 60V$