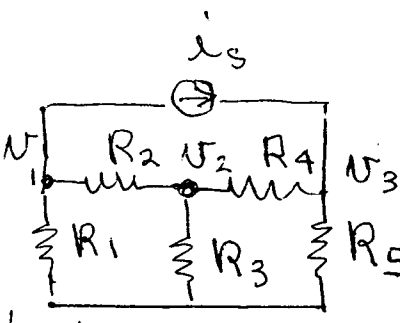
# Added Note on Cramers Rule

## Example 2.6




$$\begin{vmatrix} \frac{1}{R_1}+\frac{1}{R_2} & -\frac{1}{R_2} & 0 \\ -\frac{1}{R_2} & \frac{1}{R_2}+\frac{1}{R_3}+\frac{1}{R_4} & -\frac{1}{R_4} \\ 0 & -\frac{1}{R_4} & \frac{1}{R_4}+\frac{1}{R_5} \end{vmatrix} \begin{vmatrix} v_1 \\ v_2 \\ v_3 \end{vmatrix} = \begin{vmatrix} -i_s \\ 0 \\ i_3 \end{vmatrix}$$

$$v_3 = \frac{\Delta_{*3}}{\Delta}(-i_s) + \frac{\Delta_{33}}{\Delta} i_3$$

This is equivalent to taking the right side column as substituting into the third column of the left side matrix and evaluating the determinant; i.e.

$$v_3 = \det \begin{vmatrix} \frac{1}{R_1}+\frac{1}{R_2} & -\frac{1}{R_2} & -i_s \\ -\frac{1}{R_2} & \frac{1}{R_2}+\frac{1}{R_3}+\frac{1}{R_4} & 0 \\ 0 & -\frac{1}{R_4} & i_s \end{vmatrix}$$

$\Delta_{33}$ — the first two rows and first two columns

$\Delta_{13}$ — the first two rows and the third column