• Cramer's rule : $|A|$

i) we know $|A| = -0.4 + 0.8\alpha$

ii) Calculate $|D_y|$, $|D_c|$, $|D_I|$ and $|D_s|$

$$D_y = \begin{pmatrix} 0 & -1 & -1 & 1 \\ 80 & 1 & 0 & 0 \\ 20 & 0 & 1 & 0 \\ 24 & 0.2 & 0.2 & -1 \end{pmatrix} \quad D_c = \begin{vmatrix} 1 & 0 & -1 & 1 \\ -0.75 & 80 & 0 & 0 \\ -\alpha & 20 & 1 & 0 \\ 0 & 24 & 0.2 & -1 \end{vmatrix}, \quad D_I = \begin{vmatrix} 1 & -1 & 0 & 1 \\ -0.75 & 1 & 80 & 0 \\ -\alpha & 0 & 20 & 0 \\ 0 & 0.2 & 24 & -1 \end{vmatrix}$$

$$D_s = \begin{pmatrix} 1 & -1 & -1 & 0 \\ -0.75 & 1 & 0 & 80 \\ -\alpha & 0 & 1 & 20 \\ 0 & 0.2 & 0.2 & 24 \end{pmatrix}$$

$\boxed{|D_y|}$

$M_{21}^{D_y} = \begin{vmatrix} -1 & -1 & 1 \\ 0 & 1 & 0 \\ 0.2 & 0.2 & -1 \end{vmatrix} \rightarrow (-1)(1)(-1) + (-1)(0)(0.2) + (1)(0)(0.2) - (0.2)(1)(1) - (0.2)(0)(-1) - (-1)(0)(-1) = 1 - 0.2 = \boxed{0.8}$

$M_{22}^{D_y} = \begin{vmatrix} 0 & -1 & 1 \\ 20 & 1 & 0 \\ 24 & 0.2 & -1 \end{vmatrix} \rightarrow (0)(1)(-1) + (-1)(0)(24) + (1)(20)(0.2) - (24)(1)(1) - (0.2)(0)(0) - (-1)(20)(-1) = (0.2)(20) - 20 - 24 = 4 - 20 - 24 = \boxed{-40}$

$\boxed{\text{Same}}$

$\boxed{|D_c|}$

$M_{21}^{D_c} = \begin{vmatrix} 0 & -1 & 1 \\ 20 & 1 & 0 \\ 24 & 0.2 & -1 \end{vmatrix} \rightarrow (0)(1)(-1) + (-1)(0)(24) + (1)(20)(0.2) - (24)(1)(1) - (0.2)(0)(0) - (-1)(20)(-1) = (0.2)(20) - 24 - 20 = \boxed{-40}$

$M_{22}^{D_c} = \begin{vmatrix} 1 & -1 & 1 \\ -\alpha & 1 & 0 \\ 0 & 0.2 & -1 \end{vmatrix} \rightarrow \boxed{\text{Same}}$ as M_{22} of bigger matrix $\Rightarrow \boxed{-1 + 0.8\alpha}$

$\boxed{|D_I|}$

$M_{31}^{D_I} = \begin{vmatrix} -1 & 0 & 1 \\ 1 & 80 & 0 \\ 0.2 & 24 & -1 \end{vmatrix} \rightarrow (-1)(80)(-1) + (0)(0)(0.2) + (1)(1)(24) - (0.2)(80)(1) - (24)(0)(-1) - (-1)(1)(0) = 80 + 24 - 16 = \boxed{88}$

$M_{33}^{D_I} = \begin{vmatrix} 1 & -1 & 1 \\ -0.75 & 1 & 0 \\ 0 & 0.2 & -1 \end{vmatrix} \rightarrow (1)(1)(-1) + (-1)\cancel{(0)}(0) + (1)\cdot(-0.75)(0.2) - (0)\cdot(1)\cdot(1) - (0.2)(0)(1) - (-1)\cdot(-0.75)(-1) = -1 - 0.15 + 0.75 = \boxed{-0.4}$

$\boxed{|D_s|}$

$M_{21}^{D_s} = \begin{vmatrix} -1 & -1 & 0 \\ 0 & 1 & 20 \\ 0.2 & 0.2 & 24 \end{vmatrix} \rightarrow (-1)(1)(24) + (-1)(20)(0.2) + (0)\cdot(0)\cdot(0.2) - (0.2)(1)(0) - (0.2)(20)(-1) - (24)(0)(-1) = -24 - 4 + 4 = \boxed{-24}$

$M_{22}^{D_s} = \begin{vmatrix} 1 & -1 & 0 \\ -\alpha & 1 & 20 \\ 0 & 0.2 & 24 \end{vmatrix} \rightarrow (1)\cdot(1)\cdot(24) + (-1)\cdot(0)\cdot(0) + (0)\cdot(-\alpha)\cdot(0.2) - (0)\cdot(1)\cdot(0) - (0.2)(20)\cdot(1) - (24)\cdot(-\alpha)(-1) = 24 - 4 - 24\alpha = \boxed{20 - 24\alpha}$

$M_{24}^{D_s} = \begin{vmatrix} 1 & -1 & -1 \\ -\alpha & 0 & 1 \\ 0 & 0.2 & 0.2 \end{vmatrix} \rightarrow (1)\cancel{(0)}(0.2) + (-1)\cancel{(1)}(0) + (-1)(-\alpha)(0.2) - (0)\cdot\cancel{(0)}\cdot(-1) - (0.2)(1)(1) - (0.2)(-\alpha)(-1) = 0.2\alpha - 0.2 - 0.2\alpha = \boxed{-0.2}$

• $|D_y| = 80 \cdot (-1)^3 \cdot (0.8) + (1)(-1)^4 \cdot (-40) = -(80)\cdot(0.8) + (1)(1)(-40) =$
$= -64 - 40 = \boxed{-104}$

• $|D_c| = (-0.75)(-1)^3 \cdot (-40) + (80)(-1)^4 \cdot (-1 + 0.8\alpha) = (-0.75)(-1)(-40) + (80)(1)(-1 + 0.8\alpha)$
$= (0.75)(-40) + (80)(-1) + (80)(0.8)\alpha = -30 - 80 + 64\alpha = \boxed{-110 + 64\alpha}$

• $|D_I| = (-\alpha)\cdot(-1)^4 \cdot (88) + (20)\cdot(-1)^6 \cdot (-0.4) = (-\alpha)(1)(88) + (20)(1)(-0.4)$
$= \boxed{-88\alpha - 8}$

$\boxed{-14 - 24\alpha}$

• $|D_s| = (-0.75)(-1)^3 \cdot (-24) + (1)\cdot(-1)^4 \cdot (20 - 24\alpha) + (80)\cdot(-1)^6 \cdot (-0.2) = -18 + 20 - 24\alpha - 16$