$$\mathbf{a}\times\mathbf{b} = \begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ 1 & 3 & 2 \\ 0 & 1 & 3 \end{vmatrix} = \begin{vmatrix} 3 & 2 \\ 1 & 3 \end{vmatrix}\mathbf{i} - \begin{vmatrix} 1 & 2 \\ 0 & 3 \end{vmatrix}\mathbf{j} + \begin{vmatrix} 1 & 3 \\ 0 & 1 \end{vmatrix}\mathbf{k}$$

$$= (9-2)\,\mathbf{i} - (3-0)\,\mathbf{j} + (1-0)\,\mathbf{k} = 7\,\mathbf{i} - 3\,\mathbf{j} + \mathbf{k}$$

$$\mathbf{b}\times\mathbf{a} = \begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ 0 & 1 & 3 \\ 1 & 3 & 2 \end{vmatrix} = \begin{vmatrix} 1 & 3 \\ 3 & 2 \end{vmatrix}\mathbf{i} - \begin{vmatrix} 0 & 3 \\ 1 & 2 \end{vmatrix}\mathbf{j} + \begin{vmatrix} 0 & 1 \\ 1 & 3 \end{vmatrix}\mathbf{k}$$

$$= (2-9)\,\mathbf{i} - (0-3)\,\mathbf{j} + (0-1)\,\mathbf{k} = -7\,\mathbf{i} + 3\,\mathbf{j} - \mathbf{k}$$

Notice $\mathbf{a}\times\mathbf{b} = -\mathbf{b}\times\mathbf{a}$ here, as we know is always true by Theorem 8.