$$+(-1)^{1+2}(u_1v_3-v_1u_3)j+(-1)^{1+3}(u_1v_2-v_1u_2)k$$

**Note:** 1- the definition of cross product is defined depending on the determinate of matrix and since the determinate of matrix is defined for only the square matrices then cross product is defined for $\mathbb{R}^n$ when $n=3$ only no less no more.

2- If the Question mentioned the cross product then this means that the question is about $\mathbb{R}^3$ space.

**Example:** Let $\vec{u}=(1,2,-2)$ and $\vec{v}=(3,0,1)$, find $\vec{u}\times\vec{v}$ and $\vec{v}\times\vec{u}$

**Sol:** $$\vec{u}\times\vec{v}=\begin{vmatrix} i & j & k \\ 1 & 2 & -2 \\ 3 & 0 & 1 \end{vmatrix}=2i-7j-6k$$