

$$11. P_1 (4, 2, 3) \text{ (RED)}$$

$$P_2 (4, 3, 4) \text{ (BLUE)}$$

$$P_3 (0, -3, -1) \text{ (GREEN)}$$

$$P_4 (0, -2, 0) \text{ (BLACK)}$$

$$\begin{matrix} \text{I} & \text{T} \\ \text{RED} & \rightarrow & \text{BLUE} \end{matrix}$$

$$v = \langle 4-4, 3-2, 4-3 \rangle$$

$$= \langle 0, 1, 1 \rangle$$

$$= j + k$$

$$\begin{matrix} \text{I} & \text{T} \\ \text{RED} & \rightarrow & \text{GREEN} \end{matrix}$$

$$u = \langle 0-4, -3-2, -1-3 \rangle$$

$$= \langle -4, -5, -4 \rangle$$

$$= -4i - 5j - 4k$$

$$\textcircled{1} \quad v \times u = \begin{vmatrix} i & j & k \\ 0 & 1 & 1 \\ -4 & -5 & -4 \end{vmatrix}$$

$$= i - 4j + 4k$$

$$\textcircled{2} \quad \|v \times u\| = \sqrt{1^2 + (-4)^2 + 4^2}$$

$$= \sqrt{1 + 16 + 16}$$

$$= \sqrt{33}$$