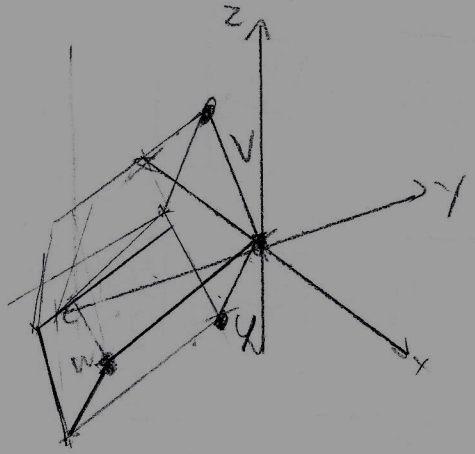
(3) $\text{comp}_a b = \dfrac{a \cdot b}{|a|}$

$b = \langle 5, -1, 4 \rangle \quad a = \langle -2, 3, -6 \rangle \quad |a| = \sqrt{4+9+36} = \sqrt{49} = 7$

$a \cdot b = -10 - 3 - 24 = -37$

$$\text{comp}_a b = \frac{-37}{7}$$

(4) $u = \langle 1, 2, -1 \rangle \quad v = \langle -2, 0, 3 \rangle \quad w = \langle 0, 7, -4 \rangle$



$|v \cdot (u \times w)| = \text{volume}$

$$u \times w = \begin{vmatrix} i & j & k \\ 1 & 2 & -1 \\ 0 & 7 & -4 \end{vmatrix}$$

$$= \begin{vmatrix} 2 & -1 \\ 7 & -4 \end{vmatrix} i - \begin{vmatrix} 1 & -1 \\ 0 & -4 \end{vmatrix} j + \begin{vmatrix} 1 & 2 \\ 0 & 7 \end{vmatrix} k$$

$\langle -1, 4, 7 \rangle$

$v \cdot (u \times w) = \langle -2, 0, 3 \rangle \cdot \langle -1, 4, 7 \rangle = 2 + 0 + 21 = 23$

$|23| = 23$

$\text{Volume} = 23 \text{ units}^3$