

1)

$$A(2, 1, 3) \quad B(4, 3, 1) \quad C(3, 2, 4)$$

$$A \cdot 1.43 = A'(2.86, 1.43, 4.29)$$

$$Q = A' + B = (2.86 + 4, 1.43 + 3, 4.29 + 1) = (6.86, 4.43, 5.29)$$

$$Q(6.86, 4.43, 5.29)$$

$$Q \rightarrow C = (-3.86, -2.43, -1.29)$$

$$R_x(45^\circ) = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & \cos 45^\circ & -\sin 45^\circ & 0 \\ 0 & \sin 45^\circ & \cos 45^\circ & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} -3.86 \\ -2.43 \\ -1.29 \\ 1 \end{bmatrix}$$

~~$$= \begin{bmatrix} -3.86 \\ -2.43 \\ -1.29 \\ 1 \end{bmatrix}$$~~

$$- 3.86 + 0 + 0 + 0$$

$$- 3.86$$

$$- 0 + 1.72 + (-0.91) + 0$$

$$- 0.81$$

$$- 0 + 1.72 + 0.91 + 0$$

$$- 2.63$$

$$+ 0 + 0 + 0 + 1$$

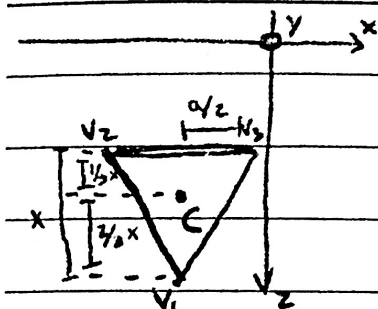
$$1$$

$$Q_{R_x}(-3.86, -0.81, -2.63)$$

$$C_R = Q + Q_{R_x} \rightarrow C$$

$$C_R(3, 3.62, 2.66)$$

2)



$$a = 3.3$$

$$P(x, y, z)$$

$$h = a \sqrt{2/3}$$

$$C(-1.812, -6.824, 5.247)$$

$$V_1(-1.812, -6.824, 7.152)$$

$$V_2(-3.462, -6.824, 4.294)$$

$$V_3(-0.162, -6.824, 4.294)$$

$$V_4(-1.812, -4.129, 5.247)$$

$$3.3^2 = 1.65^2 + x^2$$

$$x = \sqrt{3.3^2 - 1.65^2} = 2.858$$

$$x_1 = \frac{2}{3}x = 1.905 \quad x_2 = \frac{1}{3}x = 0.953$$

$$C \rightarrow V_1(0, 0, 1.905)$$

$$C \rightarrow V_2(-1.65, 0, -0.953)$$

$$C \rightarrow V_3(1.65, 0, -0.953)$$

$$C \rightarrow V_4(0, 2.695, 0)$$

$$R_y(15^\circ) = \begin{bmatrix} \cos 15 & 0 & \sin 15 & 0 \\ 0 & 1 & 0 & 0 \\ -\sin 15 & 0 & \cos 15 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$R_{V_1}(-0.493, 0, 1.84) \rightarrow$$

$$R_{V_2}(-1.348, 0, -1.348) \rightarrow$$

$$R_{V_3}(1.84, 0, -0.493) \rightarrow$$

$$R_{V_4}(0, 2.695, 0) \rightarrow$$

$$V_1'(-2.305, -6.824, 7.087)$$

$$V_2'(-3.159, -6.824, 3.899)$$

$$V_3'(0.028, -6.824, 4.754)$$

$$V_4'(-1.812, -4.129, 5.247)$$