

▼ question 1

1a

The square root of 16 is $\sqrt{c_4^2 + c_5^2 + c_6^2}$.

1b

It is not possible as there is not much data given between a and b

1c



$$\begin{aligned} 3^a R_b &= \begin{bmatrix} \cos \pi/3 & 0 & \sin \pi/3 \\ 0 & 1 & 0 \\ -\sin \pi/3 & 0 & \cos \pi/3 \end{bmatrix} \\ &= \begin{bmatrix} 0.5 & 0 & 0.86 \\ 0 & 1 & 0 \\ -0.86 & 0 & 0.5 \end{bmatrix} \end{aligned}$$

bring c_3 from b to a frame

$$\begin{bmatrix} \cancel{c_1} \\ \cancel{c_2} \\ \cancel{c_3} \end{bmatrix} \begin{bmatrix} 0.5 & 0 & 0.86 \\ 0 & 1 & 0 \\ -0.86 & 0 & 0.5 \end{bmatrix} \begin{bmatrix} c_7 \\ c_8 \\ c_9 \end{bmatrix} \quad \begin{matrix} 3 \times 3 \\ 3 \times 1 \end{matrix}$$
$$\begin{aligned} v_3 &= (0.5c_7 + 0.86c_9)\hat{a_x} + c_8\hat{a_y} + (0.5c_9 - 0.86c_7)\hat{a_z} \\ v_3 &= (0.5c_7 + 0.86c_9)\hat{a_x} + c_8\hat{a_y} + (0.5c_9 - 0.86c_7)\hat{a_z} \end{aligned}$$
$$v_1 \times v_3 =$$





