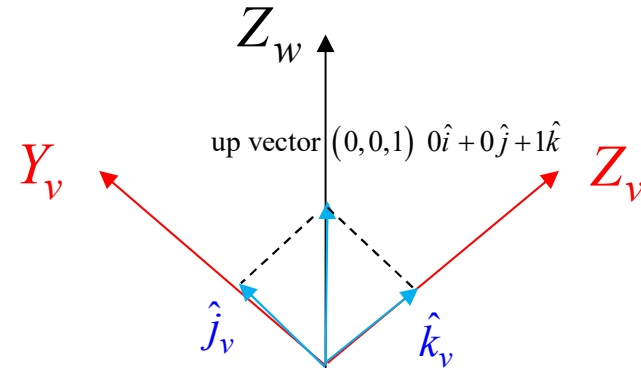
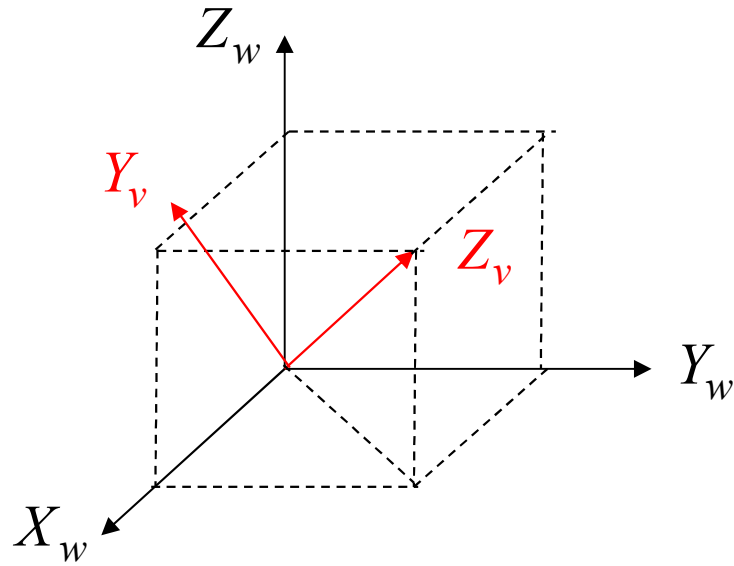


Example (p.61): Hint



Example (p.61): Solutions

$$\left. \begin{array}{l} i_v = 0i - 1j + 0k \\ j_v = 0i + 0j + 1k \\ k_v = -1i + 0j + 0k \end{array} \right\} \rightarrow T_{w-v} = \begin{bmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & -1 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \rightarrow T_{w-v} \begin{bmatrix} 5 \\ 0 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ -5 \\ 1 \end{bmatrix}$$

$$k_v = \frac{1}{\sqrt{3}}i + \frac{1}{\sqrt{3}}j + \frac{1}{\sqrt{3}}k$$

$$j_v = \frac{u_p - (u_p \cdot k_v)k_v}{|u_p - (u_p \cdot k_v)k_v|} = \frac{-\frac{1}{3}i - \frac{1}{3}j + \frac{2}{3}k}{\left|-\frac{1}{3}i - \frac{1}{3}j + \frac{2}{3}k\right|} = -\frac{1}{\sqrt{6}}i - \frac{1}{\sqrt{6}}j + \frac{2}{\sqrt{6}}k$$

$$i_v = j_v \times k_v = -\frac{1}{\sqrt{2}}i + \frac{1}{\sqrt{2}}j$$

$$T_{w-v} = \begin{bmatrix} i \cdot i_v & j \cdot i_v & k \cdot i_v & 0 \\ i \cdot j_v & j \cdot j_v & k \cdot j_v & 0 \\ i \cdot k_v & j \cdot k_v & k \cdot k_v & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 & 0 \\ -\frac{1}{\sqrt{6}} & -\frac{1}{\sqrt{6}} & \frac{2}{\sqrt{6}} & 0 \\ \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{3}} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \rightarrow T_{w-v} \begin{bmatrix} 0 \\ 0 \\ 5 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ \frac{5\sqrt{6}}{3} \\ \frac{5\sqrt{3}}{3} \\ 1 \end{bmatrix} \rightarrow \text{screen coordinate: } \left(0, \frac{5\sqrt{6}}{3}\right)$$