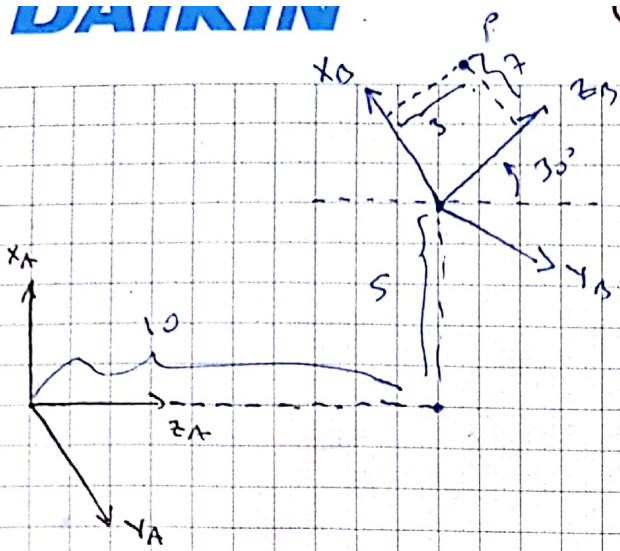


Örnek



{B} ile {A} nina x ekseninde 30 derece döndürülür. z_A ekseninde 10 birim, x_A ekseninde 5 birim sterekesi ile oluşturulmuştur. ${}^A P = [7 \ 0 \ 3]^T$ ise ${}^A P_2$?

$${}^B R = \begin{bmatrix} 1 \cdot \cos 30 & 1 \cdot \cos 30 & 1 \cdot \cos 60 \\ 1 \cdot \cos 30 & 1 \cdot \cos 0 & 1 \cdot \cos 30 \\ 1 \cdot \cos 120 & 1 \cdot \cos 30 & 1 \cdot \cos 30 \end{bmatrix} = \begin{bmatrix} 0,866 & 0 & 0,5 \\ 0 & 1 & 0 \\ -0,5 & 0 & 0,866 \end{bmatrix}$$

$${}^A P_{Bozlu} = \begin{bmatrix} 5 \\ 0 \\ 10 \end{bmatrix}$$

I-201

$${}^A P = {}^A R {}^B P + {}^A P_{Bozlu}$$

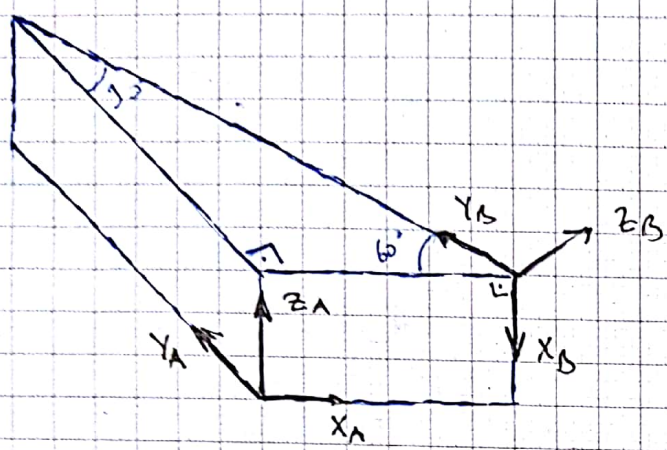
$${}^A P = \begin{bmatrix} 0,866 & 0 & 0,5 \\ 0 & 1 & 0 \\ -0,5 & 0 & 0,866 \end{bmatrix} \begin{bmatrix} 7 \\ 0 \\ 3 \end{bmatrix} + \begin{bmatrix} 5 \\ 0 \\ 10 \end{bmatrix}$$

$${}^A P_2 = \begin{bmatrix} 7,562 \\ 0 \\ -0,902 \end{bmatrix} + \begin{bmatrix} 5 \\ 0 \\ 10 \end{bmatrix} = \begin{bmatrix} 12,562 \\ 0 \\ 9,098 \end{bmatrix}$$

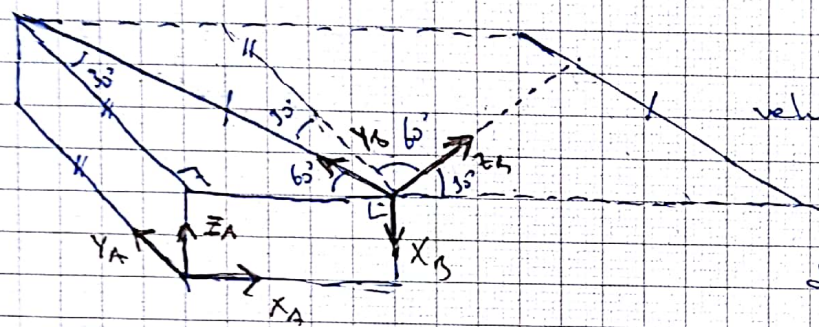
II-201

$${}^A S^T = \begin{bmatrix} 0,866 & 0 & 0,5 & 5 \\ 0 & 1 & 0 & 0 \\ -0,5 & 0 & 0,866 & 10 \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad \begin{bmatrix} {}^A P \\ 1 \end{bmatrix} = {}^A S^T \begin{bmatrix} {}^B P \\ 1 \end{bmatrix} = \begin{bmatrix} 12,562 \\ 0 \\ 9,098 \\ 1 \end{bmatrix}$$

Çev.



Şekilde gösterilen 2 koordinat sisteminden $\{B\}$ koordinat sistemine $\{A\}$ koordinat sisteminin göre yerleşimini (${}^A R_B$) bulunuz.



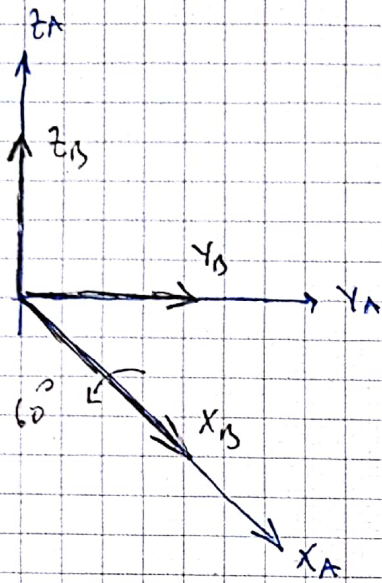
Koordinat sistemlerin birbiriyle ilişkileri bir hane diktir. Bu durumda Z_B ve Z_A aynı doğrultuda ve X_B bu düzleme

dik durmaktadır.

$${}^A R_B = \begin{bmatrix} 1 \cdot \cos 90^\circ & 1 \cdot \cos 120^\circ & 1 \cdot \cos 30^\circ \\ 1 \cdot \cos 90^\circ & 1 \cdot \cos 30^\circ & 1 \cdot \cos 60^\circ \\ 1 \cdot \cos 180^\circ & 1 \cdot \cos 90^\circ & 1 \cdot \cos 90^\circ \end{bmatrix}$$

$${}^A R_B = \begin{bmatrix} 0 & -0,5 & 0,866 \\ 0 & 0,866 & 0,5 \\ -1 & 0 & 0 \end{bmatrix}$$

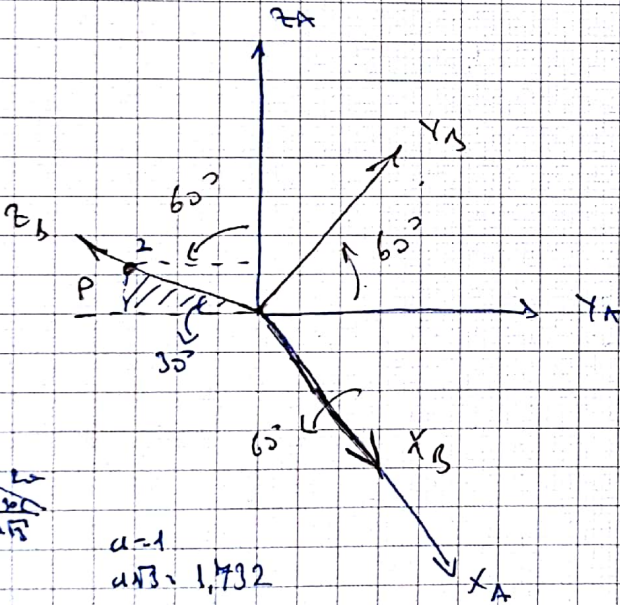
Soru



Merkeziyi orijin ve üst zote olan
 ilk koordinat sisteminden $\{B\}$ koordinat
 sisteme $\{A\}$ koordinat sistemine
 göre x ekseninde 60° döndürülmüş.

Yeni durumda $\{A\}$ koordinat sistemine
 göre ${}^A P = [0 \ 0 \ 2]^T$ konumunda
 bulunan P noktasının $\{B\}$ koordinat

sistemine göre konumu bulunur



II. Yol

$${}^A R_B = \begin{bmatrix} |x_B||x_A| \cos \psi_{AB} & |y_B||x_A| \cos \psi_{AB} & |z_B||x_A| \cos \psi_{AB} \\ |x_B||y_A| \cos \psi_{AB} & |y_B||y_A| \cos \psi_{AB} & |z_B||y_A| \cos \psi_{AB} \\ |x_B||z_A| \cos \psi_{AB} & |y_B||z_A| \cos \psi_{AB} & |z_B||z_A| \cos \psi_{AB} \end{bmatrix}$$

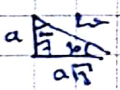
$${}^A R_B = \begin{bmatrix} 1 \cdot 1 \cdot \cos 0 & 1 \cdot 1 \cdot \cos 90 & 1 \cdot 1 \cdot \cos 90 \\ 1 \cdot 1 \cdot \cos 90 & 1 \cdot 1 \cdot \cos 60 & 1 \cdot 1 \cdot \cos 150 \\ 1 \cdot 1 \cdot \cos 90 & 1 \cdot 1 \cdot \cos 30 & 1 \cdot 1 \cdot \cos 60 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0.5 & -0.866 \\ 0 & 0.866 & 0.5 \end{bmatrix}$$

$${}^A P = {}^A R_B {}^B P = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0.5 & -0.866 \\ 0 & 0.866 & 0.5 \end{bmatrix} \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix}$$

$$= \begin{bmatrix} 0 \\ -1.732 \\ 1 \end{bmatrix}$$

I. Yol



$a=1$
 $a \sqrt{3} = 1.732$

$${}^A P = \begin{bmatrix} 0 \\ -1.732 \\ 1 \end{bmatrix}$$

✓