

CS 6301 Introduction to Robot Manipulation and Navigation Quiz 1

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Problem 1

Rotation Matrices.

Let p be a point whose coordinates are $p = \left(\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{6}}, \frac{1}{\sqrt{2}} \right)$ with respect to the fixed frame $\hat{x} - \hat{y} - \hat{z}$. Suppose that p is rotated about the fixed-frame \hat{x} -axis by 30 degrees, then about the fixed-frame \hat{y} -axis by 135 degrees, and finally about the fixed-frame \hat{z} -axis by -120 degrees. Denote the coordinates of this newly rotated point by p' .

Find the rotation matrix R such that $p' = Rp$.