Coordinate Transforms In-Class, Hands-on.

1. With two hand-held coordinate systems, rotate one 90 degrees in the Z axis relative to the first coordinate system and translated by 10 units in the x axis. Write down the resulting transformation. Find and then compare your results with the equivalent robotics toolkit command.
2. Compute the inverse of the following matrix:



Using the following equation:



Answer:



Write all your code and results in own journal.

1. Write a Matlab function to convert Euler angles (x, y, z) into a transformation matrix. Compare the result with the equivalent robotics toolkit command.

Practice these problems. The answers are given. Please show your work in your journal entries.

Spatial Descriptions:

1. Below is a frame {B} that is rotated relative to frame {A} about Z by 30 degrees. Here, Z is pointing out of the page.



1. Write the corresponding rotation matrix?
2. If a point p = [0.0, 2.0, 0.0]’ is in frame B, what is its coordinates in frame A? Write the equation and the answer. Answer: [-1.0 1.732 0.00]’
3. Verify the computation in matlab robotics toolkit.
4. Try and rotate in other axes by arbitrary amounts and verify using the toolkit.

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2. Shown below is a frame {B}, which is rotated relative to frame (A} about Z by 30

degrees, translated 10 units in Xa, and translated 5 units in Find Ya, where.

1. Find the transformation matrix.
2. Find the point P= [3., 7, 0] which is in fram B, in frame A. Answer: [9.098 12.562 0.0]’
3. Experiment with other rotation and translation mixtures and verify with Matlab



Write all your code and results in own journal.