University of Notre Dame
Aerospace and Mechanical Engineering

AME 469: Introduction to Robotics
Homework 1 Solutions

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1. (Craig, 2.27)

$$ {}^A_B T = \begin{bmatrix} -1 & 0 & 0 & 3 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}. $$

2. (Craig, 2.28)

$$ {}^A_C T = \begin{bmatrix} 0 & -\frac{1}{2} & \frac{\sqrt{3}}{2} & 3 \\ 0 & \frac{\sqrt{3}}{2} & \frac{1}{2} & 0 \\ -1 & 0 & 0 & 2 \\ 0 & 0 & 0 & 1 \end{bmatrix}. $$

3. (Craig, 2.31)

$$ {}^A_B T = \begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 4 \\ 0 & -1 & 0 & 2 \\ 0 & 0 & 0 & 1 \end{bmatrix}. $$

4. (Craig, 2.33)

$$ {}^B_C T = \begin{bmatrix} -\frac{\sqrt{3}}{2} & -\frac{1}{2} & 0 & 3 \\ 0 & 0 & 1 & 0 \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}. $$