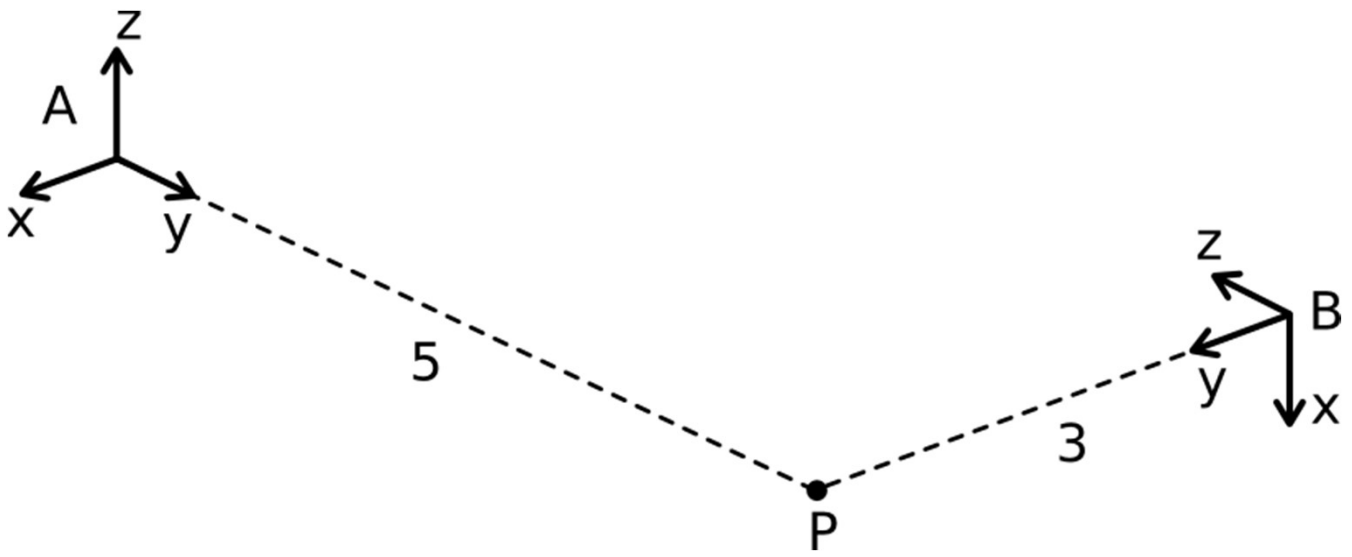
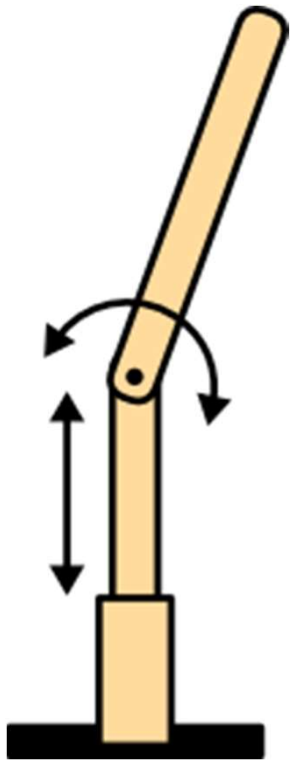

z
A
x
y
5
P
z
B
y
x
3

1) Derive the coordinate transform between A and B from the figure.

2) Compute the coordinates of P in frame A and B.

3) What is your favorite rotation representation (matrix, quaternion, Euler angles, …) and reasons why or tradeoffs (memory efficient, easy normalization, human-readable, intuitive, easy computations, …)?



1) Describe the position of the tip as a function of joint positions.

2) Derive ‘forward differential kinematics’, velocity of tip as a function of joint velocities.

3) Suppose the joints are controlled by two motors, and you want to use them to drive the tip to a desired position along a straight line.

4) Derive the joint torques as a function of end-effector force.