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Segment: S1.1 – Quizz Solution (Lecture 1, part 1)
Section: Kinematics
Topic: **Fundamentals (Vectors, Positions, Parameterization)**
Script Sec: 1, 2.1, 2.2

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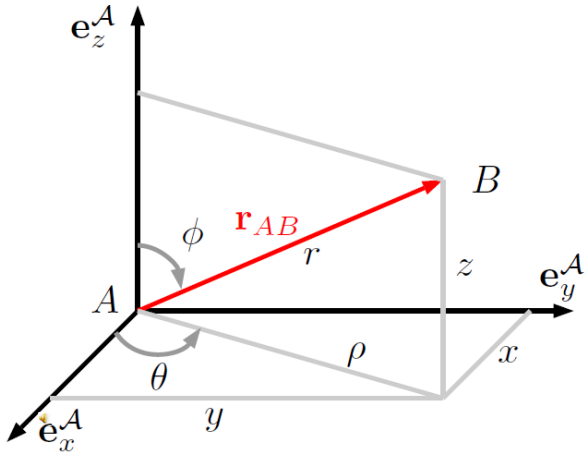
Quiz

Parameterization of Positions

Example



$$ {}_D\mathbf{r}_{AP} = {}_D\mathbf{r}_{AB} + {}_D\mathbf{r}_{BP} $$

$$ \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} + \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix} $$

$$ \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} : \begin{cases} \chi_{Pc} = \\ \chi_{Pz} = \\ \chi_{Ps} = \end{cases} \qquad \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix} : \begin{cases} \chi_{Pc} = \\ \chi_{Pz} = \\ \chi_{Ps} = \end{cases} \qquad \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} : \begin{cases} \chi_{Pc} = \\ \chi_{Pz} = \\ \chi_{Ps} = \end{cases} $$

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Segment: S1.3 – Quiz Solution (Lecture 1, part 3)
Section: Kinematics
Topic: **Introduction to Rotations, Transformations**
Script Sec: 2.4.1-2.4.4

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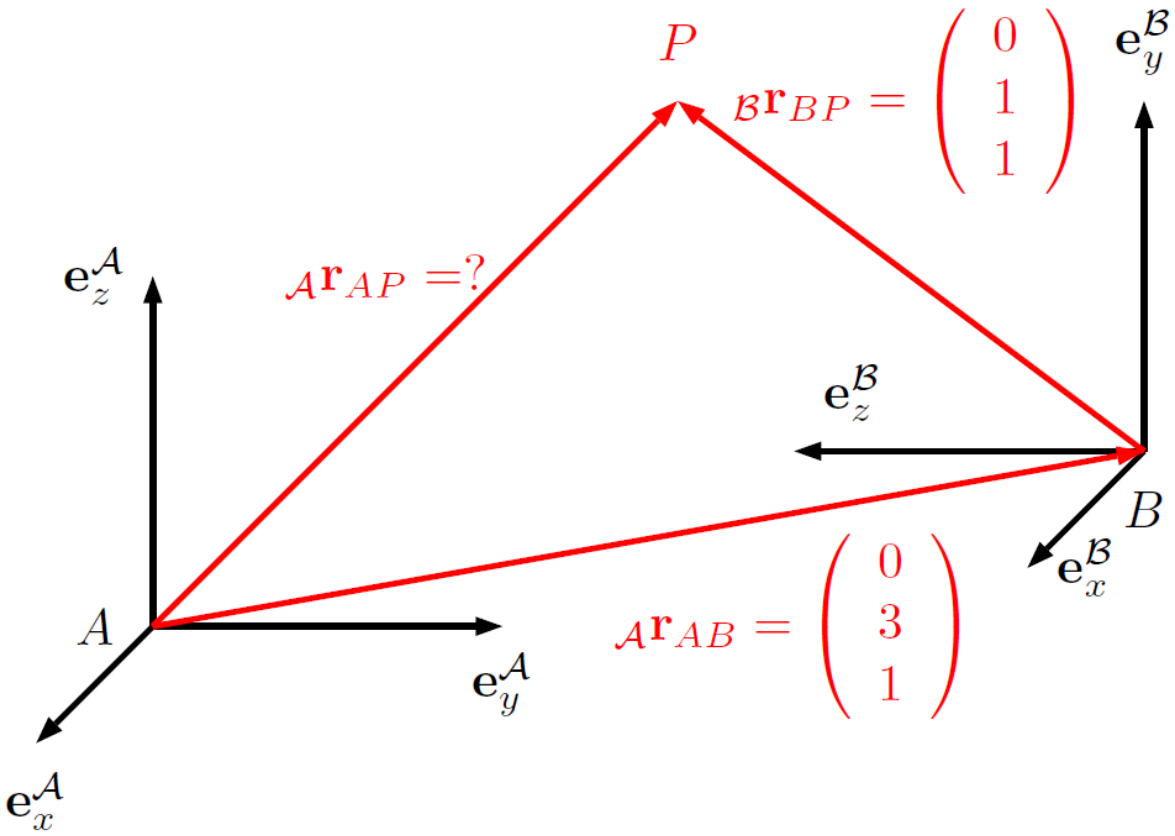
Quiz

Homogeneous Transformation
Simple Example

- Find the position vector $\mathcal{A}\mathbf{r}_{AP}$
  - Find the transformation matrix
  - Find the vector



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Segment: S1.4 – Quizz Solution (Lecture 1, part 4)
Section: Kinematics
Topic: **Angular Velocities**
Script Sec: 2.6

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Quiz

Angular Velocity
Simple Example

- Given the rotation matrix $\mathbf{C}_{\mathcal{AB}}(t) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos(\alpha(t)) & \sin(\alpha(t)) \\ 0 & -\sin(\alpha(t)) & \cos(\alpha(t)) \end{bmatrix}$

  determine ${}_{\mathcal{A}}\boldsymbol{\omega}_{\mathcal{AB}}$