

## Module 2 - Dynamics Review

ME3050 - Dynamics Modeling and Controls

May 29, 2020

### Topic 5 - Coordinate Systems

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- Using Different Coordinate Systems
- Cartesian
- Polar and Cylindrical
- Spherical
- Others ?

# Using Different Coordinate Systems

It is often convenient to use different coordinate systems as a reference for different types of problems.

You, the engineer and designer must choose the coordinate system.

# Cartesian

The Cartesian Coordinate System was invented by René Descartes in 1637. This intuitive coordinate system is still widely used today.

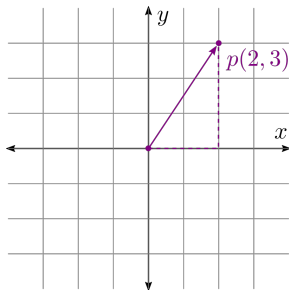
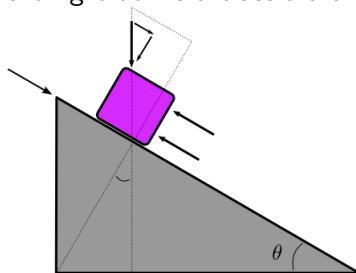


Image: Wikipedia

## Rotated Cartesian

It is common to use a Cartesian coordinate system that has been rotated such that it is aligned with a particular problem. The sliding block is a classic example of this.



## Polar and Cylindrical

For problems involving rotation it is convenient to use polar or cylindrical coordinate systems. Conversion from Cartesian to polar is straightforward using trigonometry.

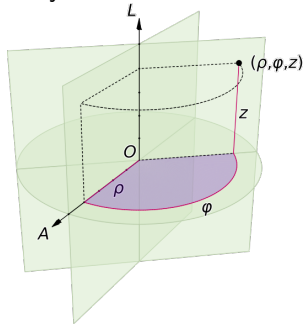
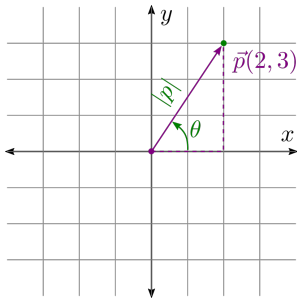


Image: Wikipedia

# Spherical

“The spherical coordinate system generalizes the two-dimensional polar coordinate system...” Wikipedia

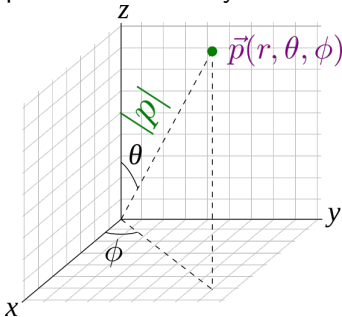


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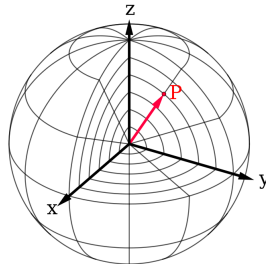


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## Others ?

Do you know of any other systems that are used?