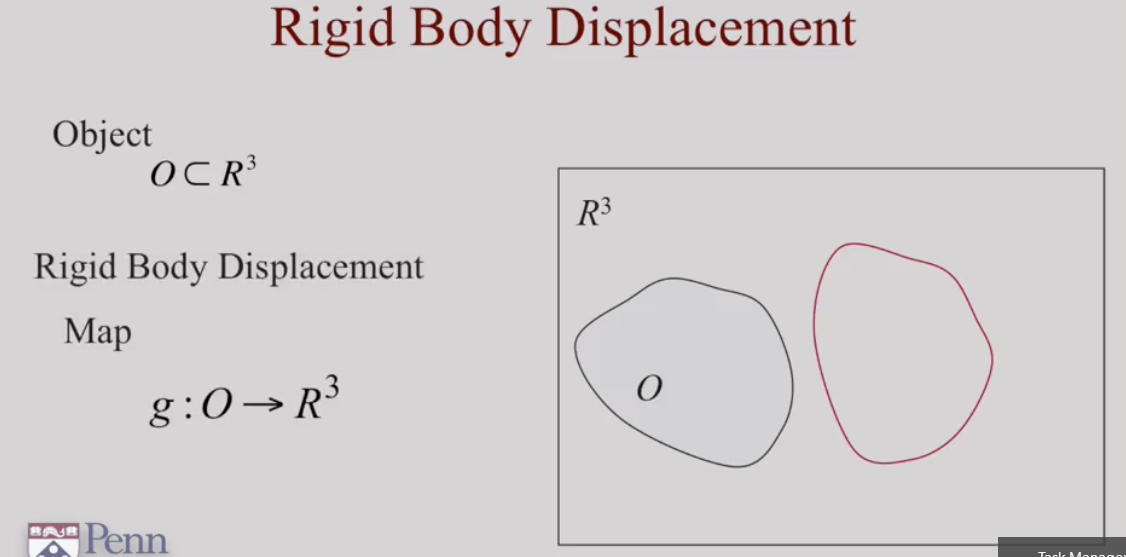
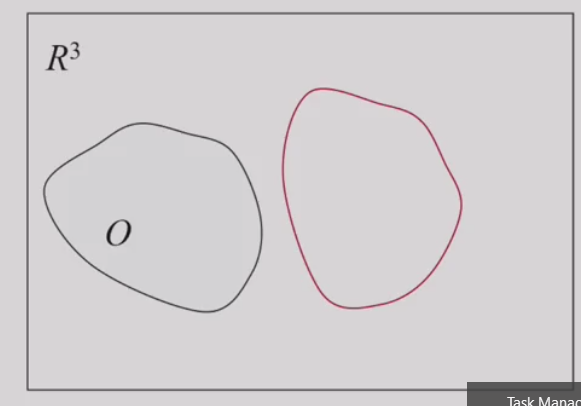
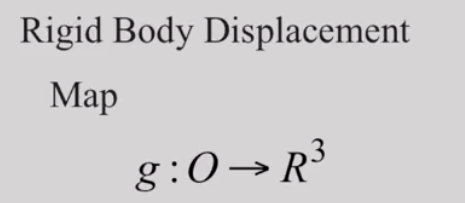


you have an object that transforms vectors in b frame to vectors in a frame



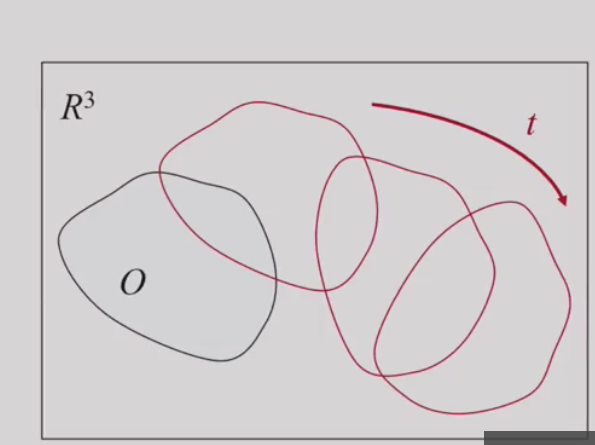
Object O = collection of points in 3D and O is subset of R3

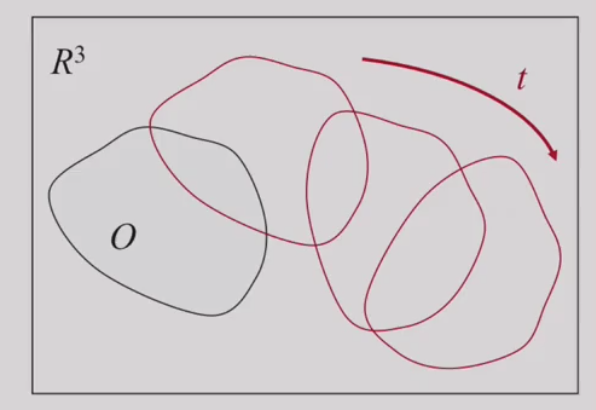
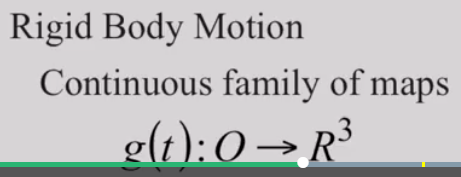
Object O can have multiple positions and orientations



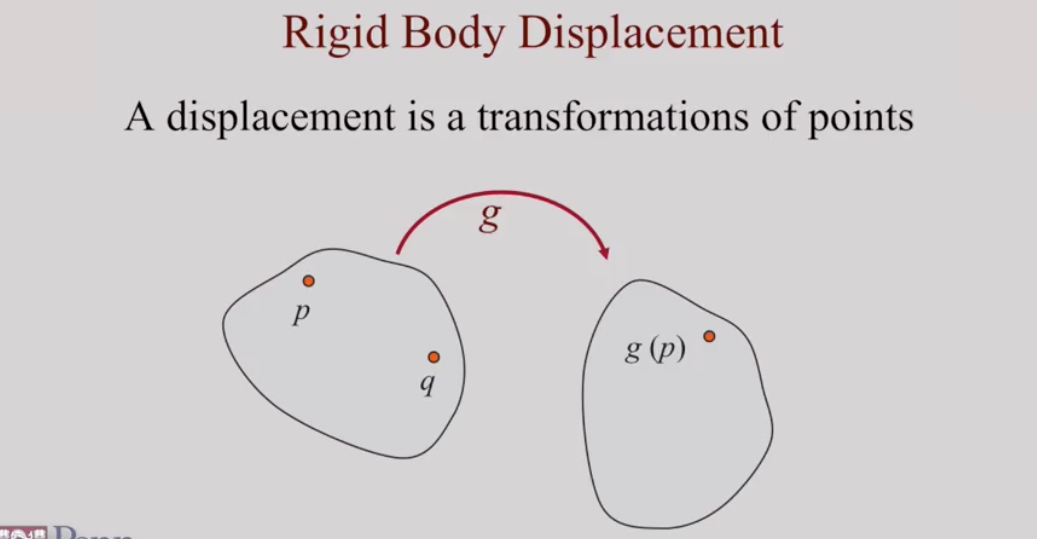
Rigid Body Displacement = is Mapping of all points in O to physical manifestation in R3

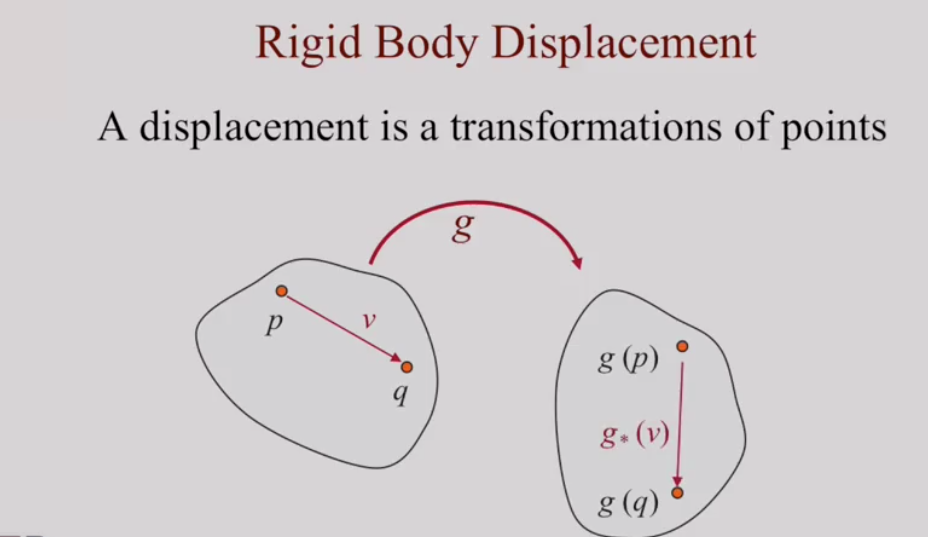
Moving of all points in Object O(Black ) to Red lined object

 As time Rigid body will have multiple positions and orientations accordingly you have rigid body disp



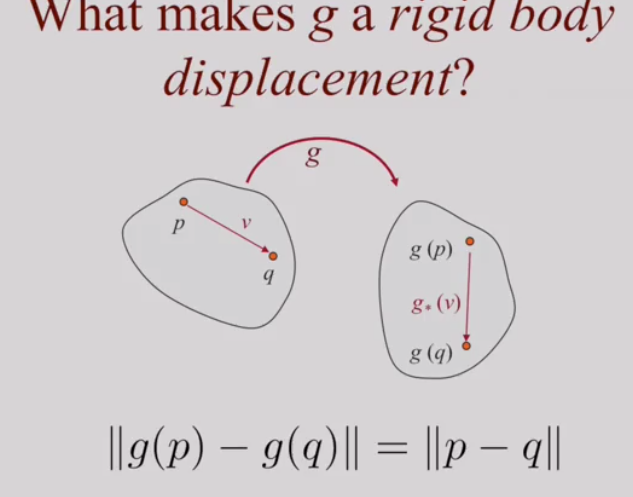
This is How rigid body motion happens🡪 object O in which all points in O are continuously changes po and orientations accordingly you have continuous displacements



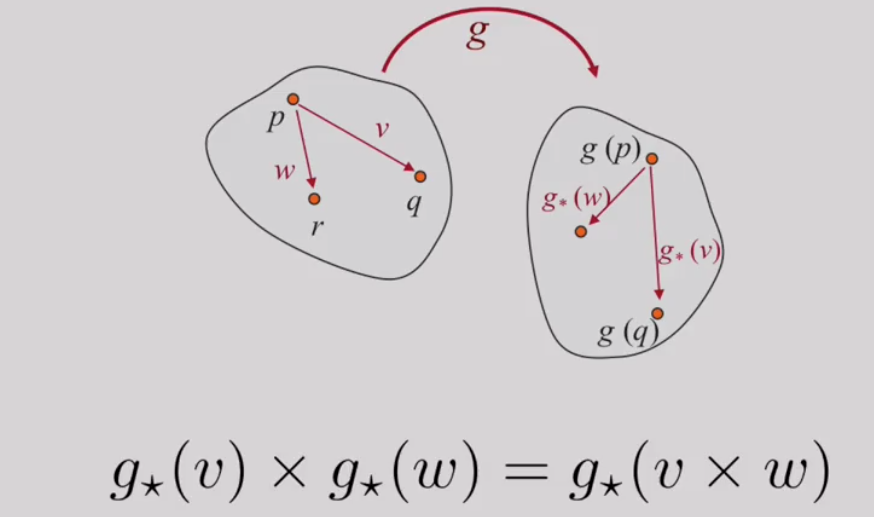


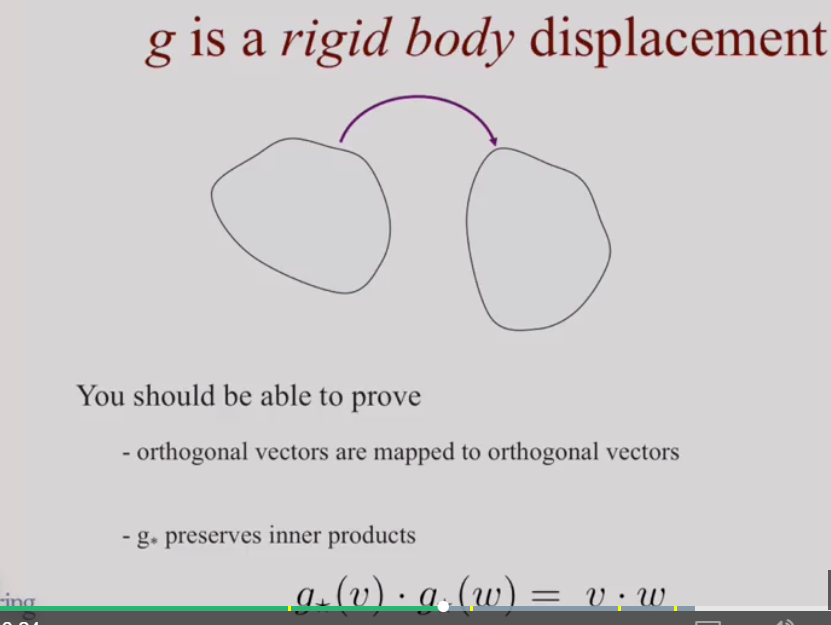
Note: 1.Displacement acts on points

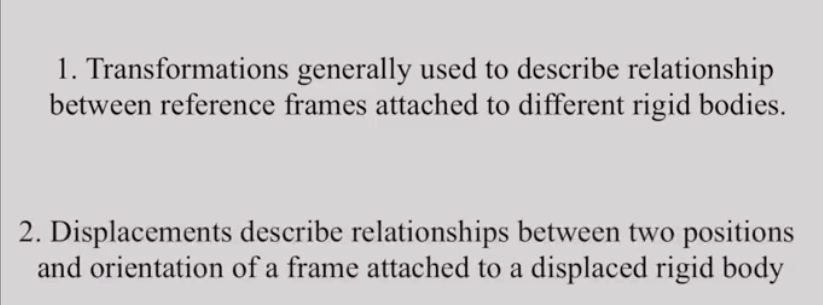
2.g\* acts on vectors

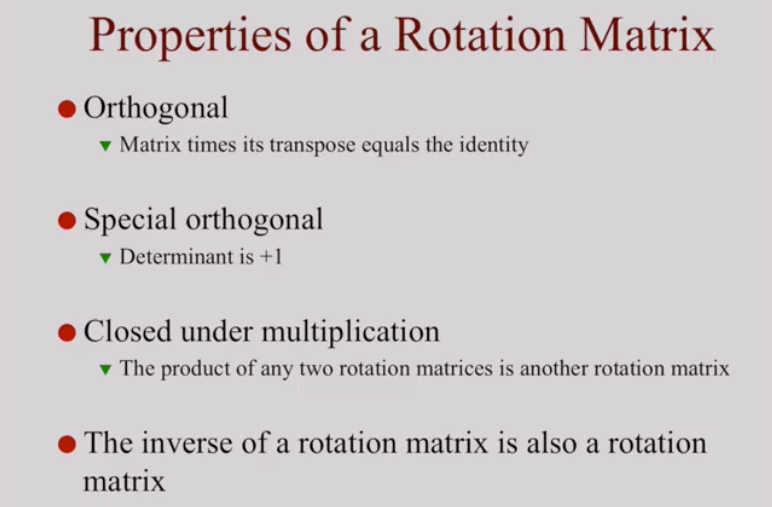


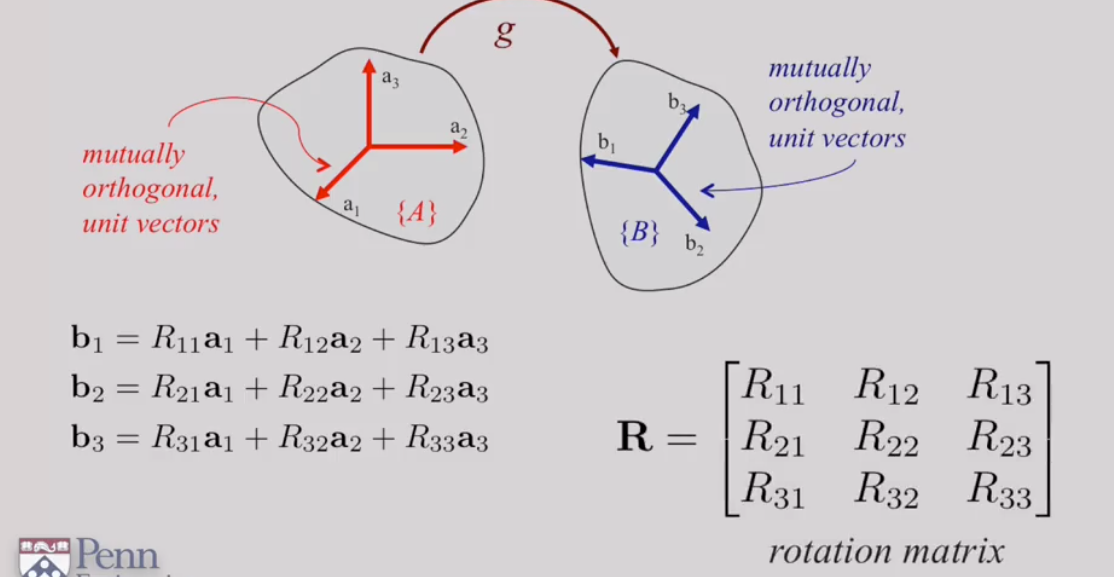
In rigid body disp -🡪 distance between points inside rigid body stays same even after transformation/disp.thats why name rigid





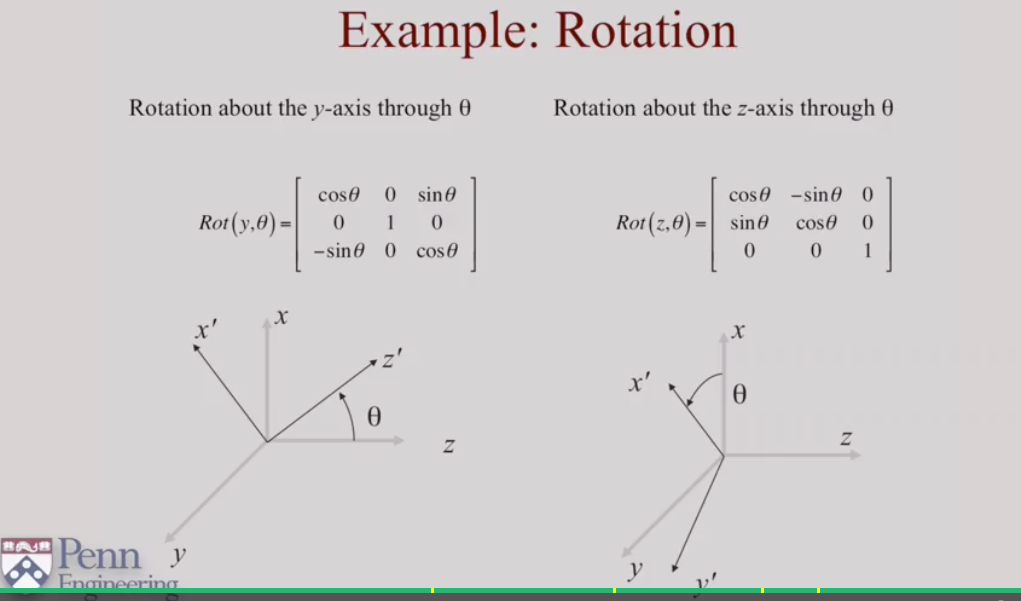


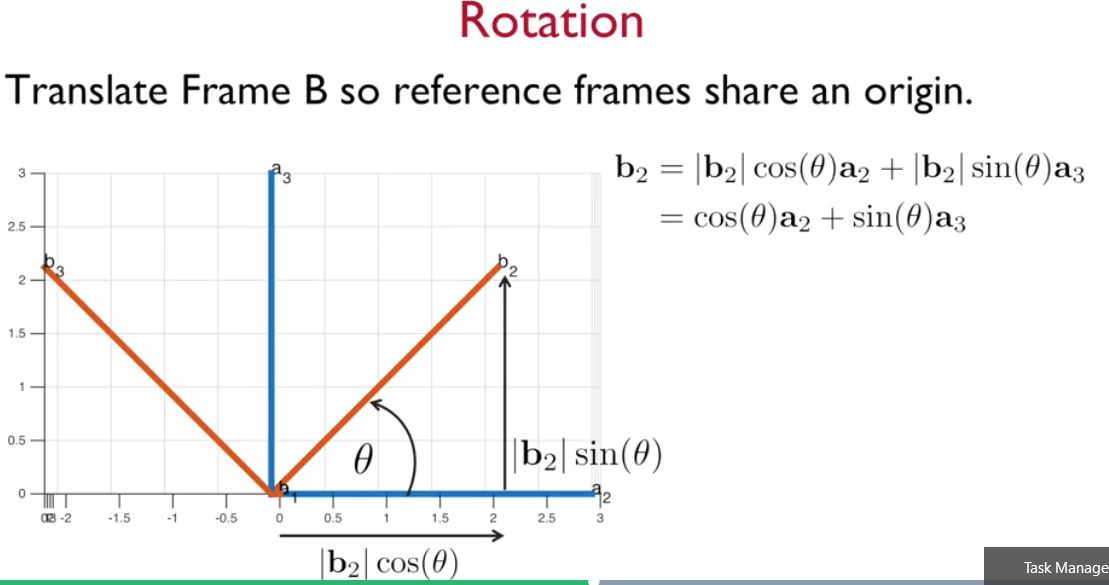


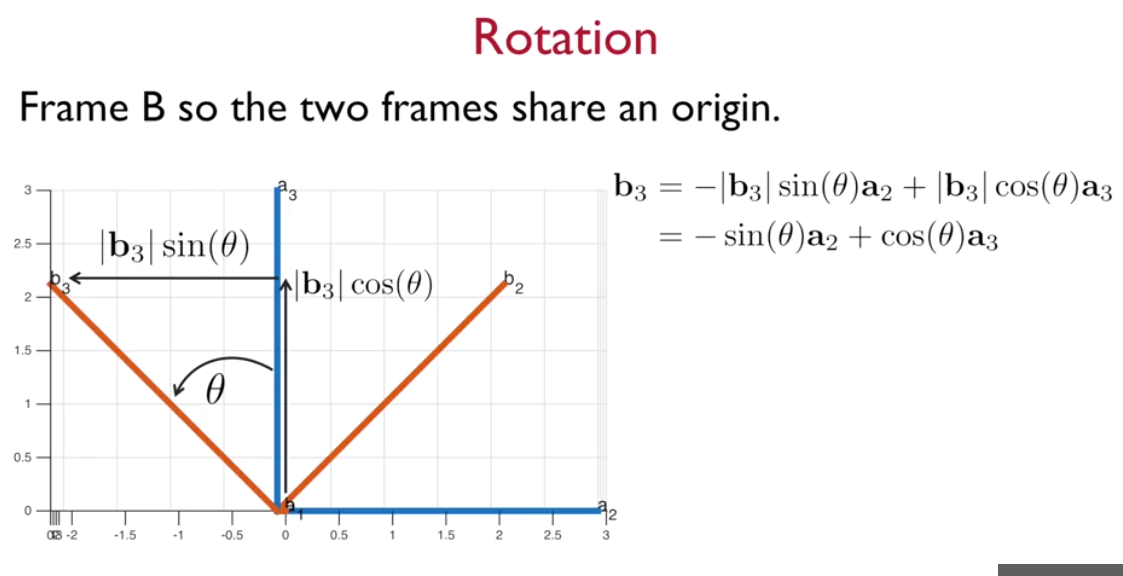


Note : 1. B1=r11a1+r12a2+r13a3 ==🡺 b1 is linear combination of a1,a2,a3

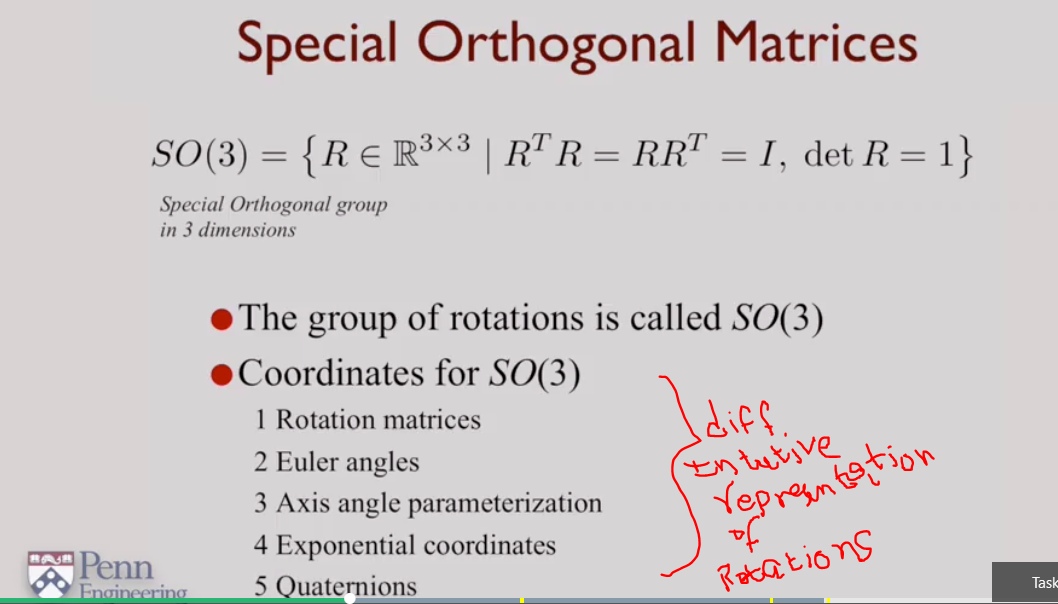
Remember always any vector can be written as linear combination of a1,a2,a3





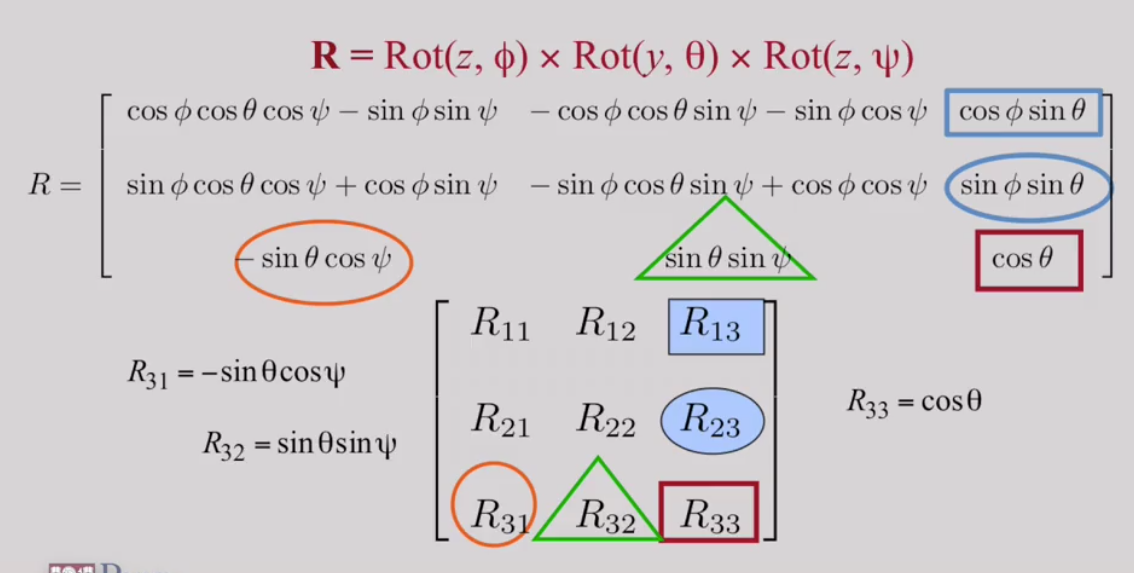


Note: Here a2 is in -ve dir when compared to b3 direction



EULER:

Euler showed 3 coordinates are needed to show general rotation,They are 3 euler angles



R is 3 euler rotation multiplied result

Now Below is Rotation matrix.

Lets say we know rotation matrix we can fins roll,pitch and yaw of eulers

**Matlab symbols**

