

- a) True. Moment of inertia tensor is real symmetric, \therefore can always be diagonalized & its eigenvectors will be orthonormal.
- b) True. Moment of inertia tensor for a cube must be invariant under rotations of 90° about any axis \perp to a face. Only matrix which has this property is a multiple of the identity, \therefore any axis is a principal axis.
- c) True. Argue analogously to case of cube, except that rotation angle is now 120° .
- d) False. Moment of inertia for sphere through its center is $(2/5)MR^2$.
- e) False. Produce counter example using Steiner's parallel axis theorem.
- f) False. See reason in part e above.