PHY121 Summer 2018
Pre-work for Monday 6/4

1. Give reasons for your answers to the following questions:
   (a) If an object is rotating, is there a net torque on it?
   (b) Is it possible to change the translational kinetic energy of an object without changing its rotational energy?
   (c) Can you change the moment of inertia of an object?
   (d) What is the difference between torque and work?

2. Calculate the moments of inertia for the following objects:
   (a) Rod about the end.
   (b) Solid cylinder about its axis of symmetry.
   (c) Challenge: Solid sphere.

3. Perform the following operations on these vectors:
   $\vec{A} =< 3, 2, 5 >; \vec{B} =< 7, 3, -8 >; \vec{C} =< 3, -4, 0 >; \vec{D} =< 1, 2, 0 >$
   (a) $(\vec{A} \times \vec{B}) \times vecC$
   (b) $\vec{A} \times (\vec{B} \times \vec{C})$
   (c) $\vec{C} \times \vec{D} + \vec{A} \times \vec{D} + \vec{B} \times \vec{C}$
   (d) $(\vec{A} \times \vec{D}) \times (\vec{B} \times \vec{A}) - (\vec{D} \times \vec{A}) \times (\vec{A} \times \vec{B}) + ((\vec{C} \times \vec{B}) \cdot \vec{A})\vec{B}$