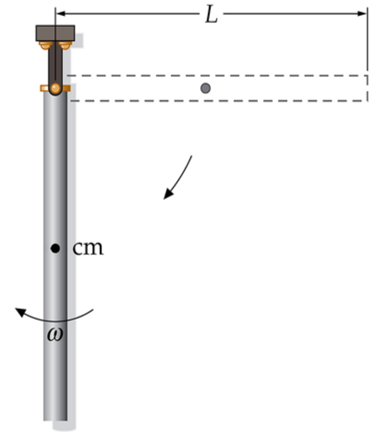
Phyx 135-1 Semi-Pop Quiz #4 **Name** ____________________________

__C__ **1a)** In the illustration at right, a horizontal bar held in place by a pivot at one end is released and allowed to rotate about the pivot. The total loss of gravitational energy of the bar as it falls will be:

A) zero, because it is only rotating.
B) mgL
C) mgL / 2
D) mgL / 3
E) mgL / 12



__B__ **1b)** The kinetic energy of this bar (when it is vertical) will be given by $E_k = \frac{1}{2} I\omega^2$. The formula for the proper I to use is:

A) $ML^2 / 2$
B) $ML^2 / 3$
C) $ML^2 / 4$
D) ML^2
E) $ML^2 / 12$
F) $2\,ML^2 / 5$

__A__ **2)** I am attempting to set up an integral to calculate the moment of inertia of a flat, uniform rectangle around an axis perpendicular to the face of the rectangle. The rectangle has a mass of "M". It also has a length of "a" along one side and "b" along the other. At some point, I will need to use which of the following substitutions to set up my integral?

A) dm / M = dx dy / ab
B) dm / M = dx / ab
C) dm / M = dy / ab
D) dm / M = dx dy / a^2
E) dm / M = dx dy / b^2

__E__ **3)** The blob shown at right has a moment of inertia around its center of mass of I = 0.08 kg m^2, and a mass of 25 g. Its rotation axis is h = 50 cm from the CM. The moment of inertia around the given axis is:

A) 0.08 kg m^2
B) 0.08 + (0.25)(0.5) = 0.205 kg m^2
C) $(0.25)(0.5)^2 - 0.08 = -0.0175$ kg m^2
D) $0.08 + (0.5)(0.25)^2 = 0.111$ kg m^2
E) $0.08 + (0.25)(0.5)^2 = 0.1425$ kg m^2