

PHYS 101

Homework # 9

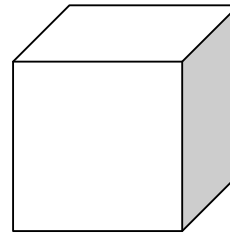
DUE DATE: December 02, 2008

Please do not submit copycat answers from the solutions book or some other solution you have in hand. You should at least show your understanding of the problem. Otherwise, this will be considered as cheating.

1) Moment of inertia needed for energy storage.

A flywheel of a gasoline engine is designed so that it gives up 300. J of kinetic energy when its angular velocity decreases from 720 rev/min. to 660 rev/min. How large must be the moment of inertia of this flywheel.

2) Find the moment of inertia of a cube (of mass M , side length L) around an axis going through one of the edges. (see figure)



3) If the melting of the polar ice caps were to raise the water level on the Earth by 10 m, by how much would the day be lengthened? Assume that the moment of inertia of the ice in the polar ice caps is negligible (they are very near the axis), and assume that the extra water spreads out uniformly over the entire surface of the Earth (that is neglect the area of the continents compared with the area of oceans). Assume that the earth is a sphere with uniform density.

4) Problem 9-64 in the text. Chapter 9.

5) Problem 9-66 in the text. Chapter 9.

6) Problem 9-76 in the text. Chapter 9.

7) Problem 9-80 in the text. Chapter 9.

8) Discussion Question Q9.14 in the text. Chapter 9.