PHY1235: Physics for Engineers

Instruction

The objective of this problem set is to learn how to calculate the rotational kinetic energy of a rigid body and determine the moment of inertia of mass distribution.

Issued: 04/06/2020 --- **Due:**

Helpful readings for this homework: Lecture #2; Chapter 9, section 9.3 of University Physics

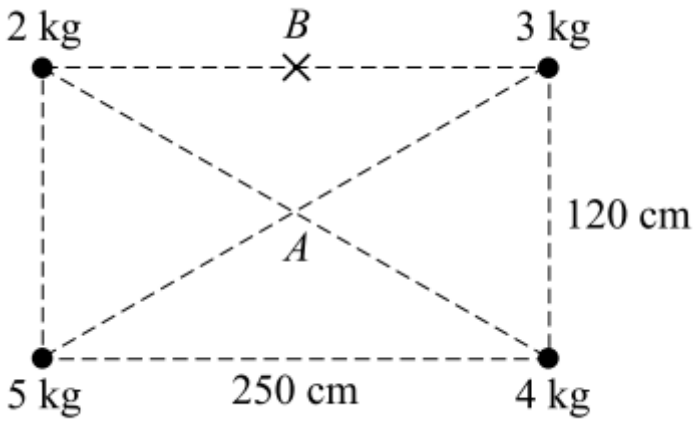
Problem Set #2: Energy in Rotational Motion

Problem 1:

A wheel of mass 6.0 kg and radius of 40 cm is rotating at 300 rpm (rev/min). Find its (a) moment of inertia and (b) its rotational kinetic energy.

Problem 2:

Find the moment of inertia of the four masses shown in figure below relative to an axis perpendicular to the page and extending (a) though a point A and (b) through point B.



Expected Answers

Problem 1:

a) 0.96 $\mathrm{kg} \cdot m^2$

b) 0.47 kJ

Problem 2:

a) 27 $\mathrm{kg} \cdot m^2$

b) 33 $\mathrm{kg} \cdot m^2$