

PHYS 1401 General Physics I
Homework #7

For the first two questions, express your final answer in the form of a **complete sentence**, with the correct units and number of significant figures. Do not just circle a number. Show all calculations, and draw diagrams where appropriate. The last six questions are found on the [Mastering Physics](#) site, and are worth a point each.

It would be a good idea to try the Tutorials before tackling the homework problems. If you complete the entire Tutorial for Homework #8, you will get 1 bonus point. If you complete any part of the Tutorial, you will get half a bonus point.

Do these problems on paper and turn them in

1. (2 points) Answer the following questions about the situation in Chapter 10, Problem 12, p.318
 - a. What is the linear acceleration of the suitcase as it falls? (Hint: It's not in free fall!)
 - b. What is the resulting angular acceleration of the wheel?
 - c. What is the angular velocity of the wheel when the suitcase hits the ground?
 - d. What is the tension in the string as the suitcase falls? (Hint: It is not equal to the weight of the case! Use Newton's Second Law!)
 - e. What is the torque caused by that tension?
 - f. What is the moment of inertia of the wheel?
2. (2 points) Chapter 10, Problem 40, p. 320

These are the problems from the book that are online. The data are different, so you can work them out without numbers and then go online.

1. Chapter 10, Problem 11, p. 318 (Note the pulley is not a uniform cylinder! Consult page 268!)
2. Chapter 10, Problem 37, p. 320
3. Chapter 10, Problem 43, p. 320
4. Chapter 10, problem 45, p. 321
5. Chapter 10, Problem 59, p. 322
6. Chapter 11, Problem 6, p. 352