

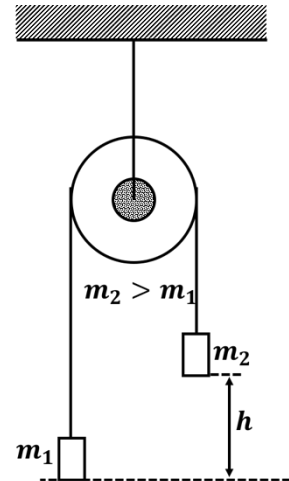
Name _____ Instructor name _____

You must show and explain all work neat and organized to receive credit. Please show each step for calculations. YOU MUST TURN IN THIS SHEET to have your assignment graded.

1. (a) Write Newton's second law for rotational motion. (b) As shown in the figure, Atwood's machine consists of two masses connected by a string that passes over a pulley. Consider the pulley to be massless and frictionless. Show **in detail** that, if released for rest, m_2 takes a time

$$t = \sqrt{\frac{2h(m_2 + m_1)}{g(m_2 - m_1)}}$$

to reach the floor. (10 pts)



2. Let m' be the pulley's mass in Question 1. If the effect of friction on the pulley is considered (as it is in Experiment 3), how long does it take m_2 to reach the floor? The mass is again released from rest and height h . **Please show detailed calculations.** (10 pts)