

9. [7 points] Emily is transporting a chocolate ice cream cone up 1 story of East Hall to her friend. However, there is a hole in the bottom of the cone and ice cream drips out in a steady stream.

The mass of the cone is 200 grams and there are initially 100 grams of ice cream in the cone. The ice cream drips out at a rate of 4 grams/sec. Emily spends 10 seconds raising the cone at a constant rate of 0.5 m/sec to reach her friend.

- a. [3 points] What is the total mass in grams of the cone and the ice cream in the cone when Emily has lifted it a vertical distance ℓ m?

Mass = _____ grams

- b. [4 points] Write, but do not evaluate, an integral that represents the total amount of work (in grams m^2/sec^2) done by Emily lifting the cone filled while the ice cream drips. You may assume the acceleration due to gravity is $g = 9.8 \text{ m}/\text{sec}^2$.

Work = _____ grams m^2/sec^2