

Name _____

Homework 10

Section 8.4

1. (7) A washer is created by taking a disk of radius 4 cm and cutting a 2 cm diameter hole from the center. The original disk has a density of 9 g/cm^2 at its center, and a density of 3 g/cm^2 at its edge. If its density of the washer is a linear function of the distance from the center, find the mass of the resulting washer.

2. (6) The density of cars, given in cars per mile, along a certain stretch of road is approximated by $\rho(m) = 250 + 200 \cos(.4m)$, at a distance m miles north of the Henderson toll bridge. Find the average number of cars per mile on the 15 mile stretch of road *starting 5 miles south of the bridge*.

3. (7) A tank is created by taking a conical tank with a base diameter of 8 feet and height 16 feet and cutting off the top 9 feet and then inverting it. Thus the resulting tank is 7 feet tall, with a diameter of 8 feet at the top. A cross section of the tank is shown below. The tank is filled to a height of 5 feet with a substance whose density is given by $\delta(h) = 100 - 2h$ lb/ft³, where h is measured as feet from the bottom of the tank. Find the weight of the substance in the tank.

