

Quiz 6

Name:

Directions: Answer each question to the best of your ability. You may use a calculator, but you must show all work to receive full credit. For problem 1, set up your definite integral based on the Riemann sum with the conditions given. If it is helpful, draw a picture of the problem. (5 pts each)

1. Find the volume of a cone with base radius 5 and total height 10 taking slices parallel to the base.

2. The function for the density of the population in terms of x , the number of miles from downtown Houghton, is $\delta(x) = \frac{100}{x^2}$ with units ppl/mi^2 . What is the total population living between 1 and 15 miles from downtown Houghton?

3. A cylindrical metal rod has a constant cross-sectional area of 4 in^2 and is 20 in. long. If the function for the density is $\delta(x) = 25 - x$ where x is the number of inches from the left side of the rod, what is the total mass of the rod?

4. Given the left end of the rod is placed at the origin, where is the center of mass of the rod?

5. An anchor weighing 500 lb is attached to the end of a 75 ft chain which weighs 5 lb/ft . How much work is done to hoist the anchor the entire length of the chain?