
1. (1 pt)

Electric charge is distributed over the disk $x^2 + y^2 \leq 17$ so that the charge density at (x,y) is $\sigma(x,y) = 9 + x^2 + y^2$ coulombs per square meter. Find the total charge on the disk.

2. (3 pts)

A lamina occupies the part of the disk $x^2 + y^2 \leq 4$ in the first quadrant and the density at each point is given by the function $\rho(x,y) = 5(x^2 + y^2)$.

A. What is the total mass? _____

- B. What is the moment about the x-axis? _____
C. What is the moment about the y-axis? _____
D. Where is the center of mass? (_____, _____)
E. What is the moment of inertia about the origin?
-

3. (1 pt)

A lamp has two bulbs, each of a type with an average lifetime of 10 hours. The probability density function for the lifetime of a bulb is $f(t) = \frac{1}{10}e^{-t/10}, t \geq 0$.

What is the probability that both of the bulbs will fail within 2 hours?
