Applications of double integral.

Spring 2016

Attendance Quizzes

April 1, 2016

Quiz 24 Applications of double integral.

Consider the triangular lamina T with corners $A(0,0), B(6,6), C(0,6)$. Assume that it has density function $\rho(x,y) = xy^2$.

Set up the necessary integrals and calculate the indicated quantities. It is not required to evaluate the integrals in class, but all setup must be complete.

1. The mass m of T is given by: **Answer:**

$$m = \int_{y=0}^{6} \int_{x=0}^{y} xy^2 \, dx \, dy = \frac{3888}{5} = 777.6$$

2. If (a,b) is the center of mass of T, then a and b are given by these ratios of integrals:
Answer:

$$a = \frac{1}{m} \int_{y=0}^{6} \int_{x=0}^{y} x^2 y^2 \, dx \, dy = \frac{2592}{777.6} = 3.33. b = \frac{1}{m} \int_{y=0}^{6} \int_{x=0}^{y} xy^3 \, dx \, dy = \frac{3888}{777.6} = 5$$