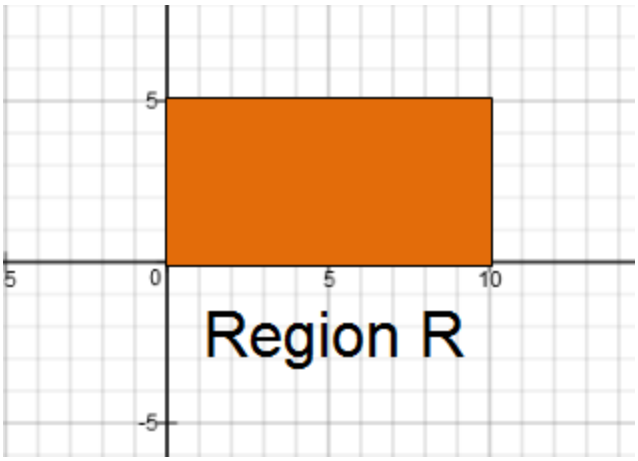
Calculus III Section 14.4 Homework

1) Find the mass (m) of the lamina corresponding to region R with the given desisty function ρ.

$\rho(x, y) = 4xy.$

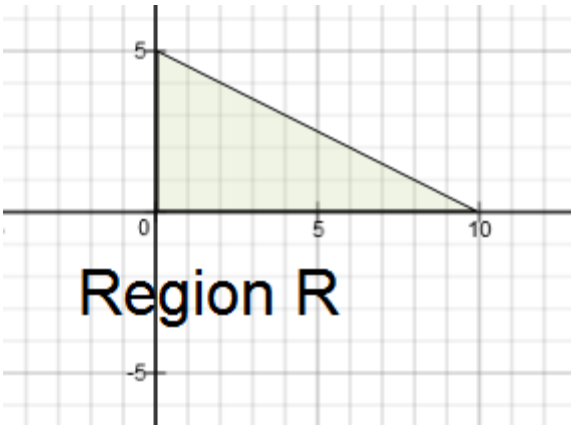
$m = \iint_R \rho(x, y)dA =$?



2) Find the mass (m) of the lamina corresponding to region R with the given desisty function ρ.

$\rho(x, y) = 5xy.$

$m = \iint_R \rho(x, y)dA =$?



3) Find the mass and the center of mass of the lamina bounded by the following graphs.

$y = x;\ \ y = 0;\quad x = 1;$

Density Function: $\rho(x, y) = 4x.$

a) mass of lamina: $m = \iint_R \rho(x, y)dA =$ __?__

b) moment of mass with respect to x-axis: $M_x = \iint_R y\rho(x, y)dA =$ __?__

c) moment of mass with respect to y-axis: $M_y = \iint_R x\rho(x, y)dA =$ __?__

d) Center of Mass: $\bar{x} = \frac{M_y}{m} =$ __?__ $\bar{y} = \frac{M_x}{m} =$ __?__

4) Find the mass and the center of mass of the lamina bounded by the following graphs.

$y = e^x;\ \ y = 0;\quad x = 0;\ \ x = 3$

Density Function: $\rho(x, y) = 8xy.$

a) mass of lamina: $m = \iint_R \rho(x, y)dA =$ __?__

b) moment of mass with respect to x-axis: $M_x = \iint_R y\rho(x, y)dA =$ __?__

c) moment of mass with respect to y-axis: $M_y = \iint_R x\rho(x, y)dA =$ __?__

d) Center of Mass: $\bar{x} = \frac{M_y}{m} =$ __?__ $\bar{y} = \frac{M_x}{m} =$ __?__

5) Find the moments of inertia of the lamina bounded by the following graphs.

$y = x^2;\ \ y = 0;\quad x = 2$

Density Function: $\rho(x, y) = 2xy$.

a) I_x = moment of inertia with respect to x-axis = $\iint_R y^2 \rho(x, y) dA$ = _?_____

b) I_y = moment of inertia with respect to y-axis = $\iint_R x^2 \rho(x, y) dA$ = _?_____

6) Find the moments of inertia of the lamina bounded by the following graphs.

$y = \sqrt{x};\ \ y = 0;\quad x = 1$

Density Function: $\rho(x, y) = 5xy$.

a) I_x = moment of inertia with respect to x-axis = $\iint_R y^2 \rho(x, y) dA$ = _?_____

b) I_y = moment of inertia with respect to y-axis = $\iint_R x^2 \rho(x, y) dA$ = _?_____