

MATH 1710 Tutorial 5

1. Find the moment of inertia of a plate with constant mass per unit area ρ and edges defined by the curves

$$x = y^3, \quad x = 1, \quad y = 0,$$

about the lines (a) $x = 2$, and (b) $y = -1$.

2. Find the moment of inertia of a plate with constant mass per unit area ρ and edges defined by the curves

$$y = 4 - 2x, \quad y = 2x^2, \quad x = 0,$$

about the line $y = 4$.

3. Find the moment of inertia of a plate with constant mass per unit area ρ and edges defined by the curves

$$y = x + 1, \quad x = \sqrt{3 - y}, \quad y = 0,$$

about the x -axis.

4. A plate with constant mass per unit area ρ is in the shape of a triangle with sides of length 2, 3, and 3. Find its moment of inertia about the shortest side.

Answers

1. (a) $111\rho/70$ (b) $91\rho/60$ 2. $1346\rho/105$ 3. $(432\sqrt{3} - 548)\rho/105$ 4. $8\sqrt{2}\rho/3$