

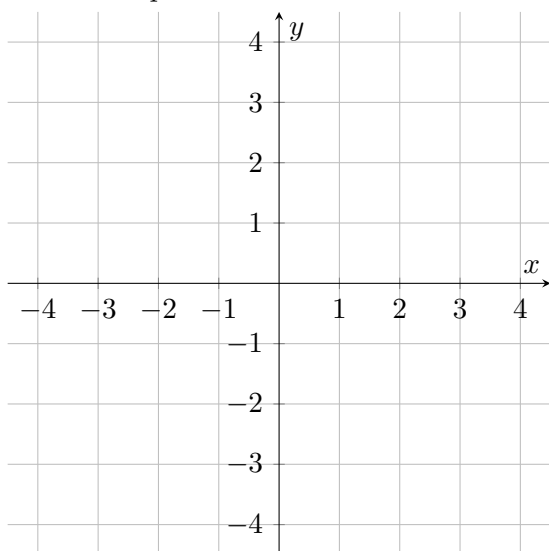
Name: _____

1. Consider a thin plate bounded by the parabola $x = y - y^2$ and the line $x + y = 0$. The density of the plate is given by $\delta(x, y) = x + y$. Set up an integral to find the plate's moment of inertia about the x -axis. You do not need to evaluate the integral.

The following parts guide you through this problem step by step.

- (a) What are the points of intersection of the parabola and the line?

- (b) Sketch the plate.



- (c) Set up an iterated integral to compute the moment of inertia about the x -axis. Make sure you determine the bounds for x and y and the formula for the integrand. Also, recall that the problem does not require you to evaluate the integral.

2. Evaluate the integral

$$\int_0^6 \int_{-\pi}^0 \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \rho^2 \sin 2\varphi \, d\varphi \, d\theta \, d\rho$$