

## AREAS AND VOLUMES

1. In this problem we'll work with the area enclosed by the curves  $y = x^3$  and  $x = y^2$ . Note that there is no need to evaluate any integrals in this problem (unless you run out of other things to do).



- a) Sketch the area.
- b) Find a  $dx$  integral for the area.

c) Find a  $dy$  integral for the area.

d) Suppose that the area is the base of a solid whose cross-sections perpendicular to the  $x$ -axis are squares. Find an integral for the volume of the solid.

- e) Suppose that the area is the base of a solid whose cross-sections perpendicular to the  $y$ -axis are hemispheres. Find an integral for the volume of the solid.
- f) Suppose that the area is rotated about the  $x$ -axis to determine a solid. Find an integral for the volume of the solid.
- g) Suppose that the area is rotated about the  $y$ -axis to determine a solid. Find an integral for the volume of the solid.