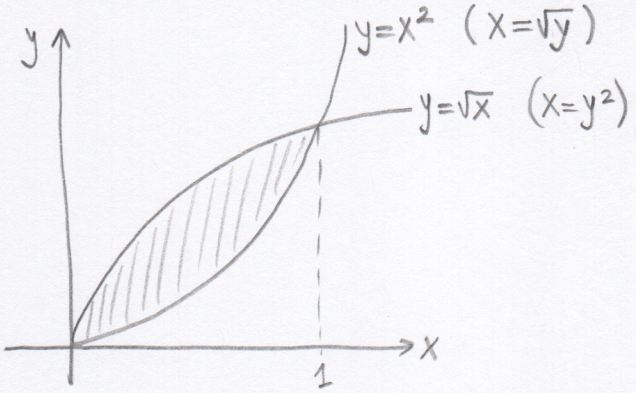
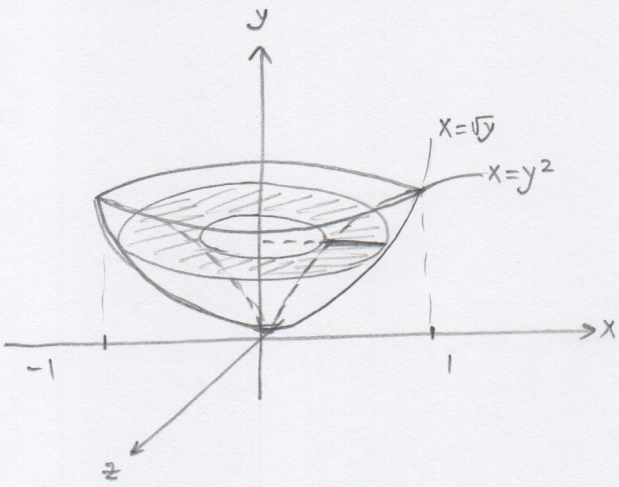
Name: Solutions **Section:** _____

Clear your desk of everything except pens, pencils and erasers. **Show all your work.**
If you have a question raise your hand and I will come to you.

1. Find the volume of the solid generated by rotating the region of the $x-y$ plane between the curves $y=x^2$ and $y=\sqrt{x}$, for $0 \le x \le 1$, about the y-axis.

   (a) (4 points) Draw a picture of the region in the plane, and a picture of the solid.





   (b) (3 points) Write the formula for the area of a cross-section.

Outer area: $\pi(\sqrt{y})^2 = \pi y$

Inner area: $\pi(y^2)^2 = \pi y^4$

$$A(y) = \pi y - \pi y^4$$

   (c) (3 points) Set up, **but do not evaluate**, the integral representing the volume of the solid.

$$V = \int_0^1 \pi(y-y^4)\,dy$$