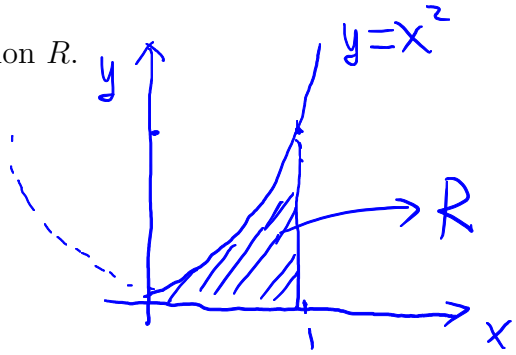
Name: _____ **ID:** _____

Clear your desk of everything except pens, pencils and erasers. Show all work clearly and in order. No notes, phones and calculators. You have 10 minutes to finish these **FOUR** parts for 10 points.

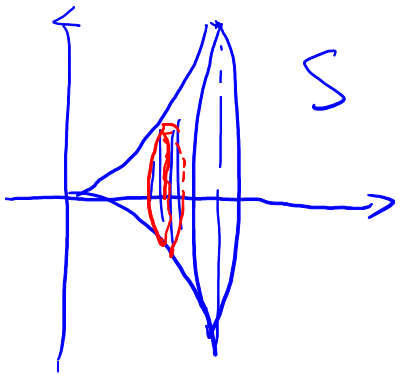
Formula Sheet. Volume: Suppose $A(x)$ is the cross-sectional area of the solid S perpendicular to the x-axis, then the volume of S is given by $V = \int_a^b A(x)dx$.

1. Region R is bounded by the curves $y = x^2, y = 0$ and $x = 1$. The solid S is generated by rotating R about the x-axis.

   (a) (2 points) Sketch the region R.



   (b) (3 points) Sketch the solid S.



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

$$A(x) = \pi \cdot r^2 = \pi \cdot (x^2)^2$$

   (d) (2 points) Set up, **but do not evaluate**, the integral representing the volume of the solid S.

$$V = \int_0^1 A(x)\,dx = \int_0^1 \pi \cdot x^4\,dx.$$