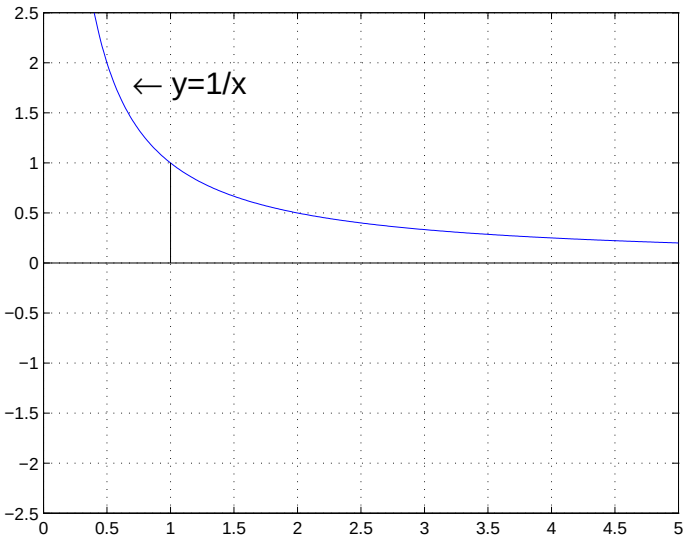
NAME AND SECTION:_____

INSTRUCTOR'S NAME:_____

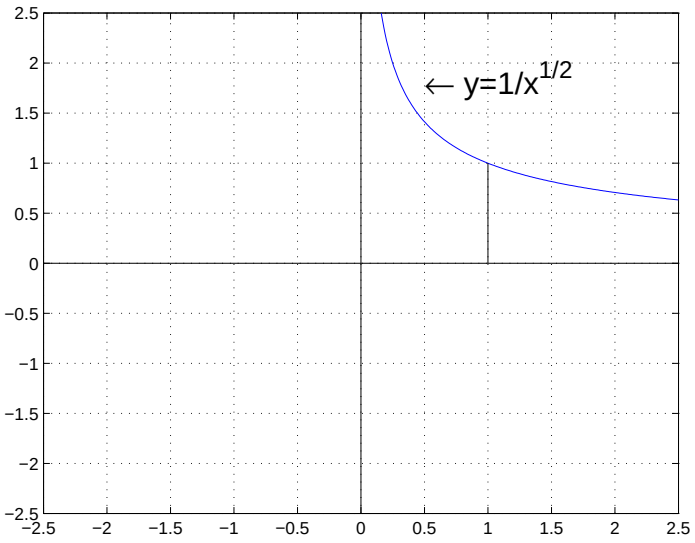
1. Shade and compute the area of the region in between the curves $y = 1/x$, $y = 0$, and $x = 1$.



2. Sketch and compute the volume of the solid obtained by rotating this region around the x-axis.

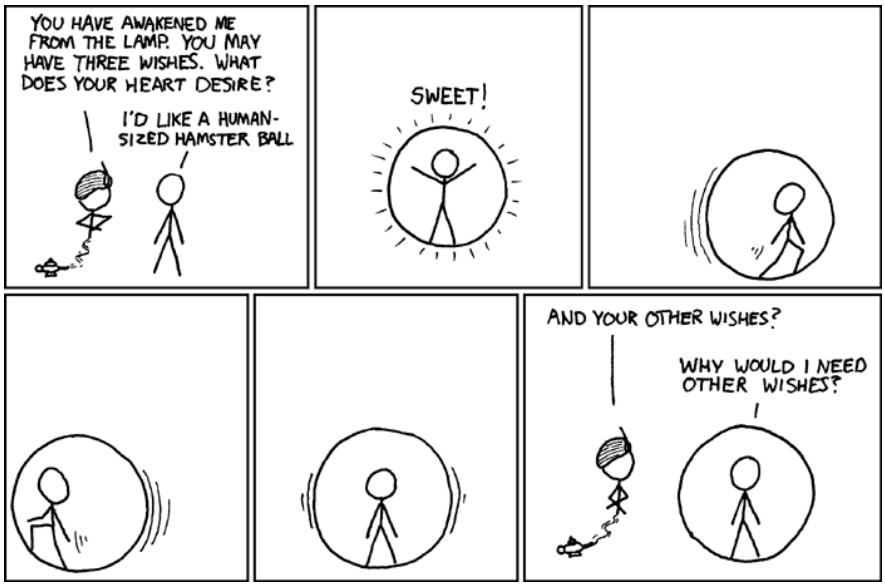
3. What is your conclusion?

4. Shade and compute the area of the region in between the curves $y = 1/\sqrt{x}$, $y = 0$, $x = 0$, and $x = 1$.



5. Sketch and compute the volume of the solid obtained by rotating this region around the x-axis.

6. What is your conclusion?



7. Imagine that Matt and Giulio are powerful and evil wizards. One day they use their evil powers to transform the body of one of their student into that of a revolting worm. The students' task, in order to pass Matt and Giulio's Defense Against the Dark Arts course, is to try to cross a rubber band whose initial length is 12 inches. One end of the band is connected to the wall of Matt and Giulio's evil dungeon and the other end lies in Matt and Giulio's evil hands. The speed of a revolting worm is 1 inch per minute, but the evil Matt and Giulio increase the length of the rubber band uniformly by 1 inch every minute.

   (a) What is the length of the rubber band after t minutes?

   (b) What fraction of the band per minute does the revolting worm cover by time t?

   (c) Is the student going to pass the Defense Against the Dark Arts course?