

7. [13 points] Kazilla is designing a new board game. She is interested in using the region R in the xy -plane bounded by $y = 2$, $y = x$, $x = 1$ and $x = 0$.
- a. [4 points] The first part of the game is a spinning top formed by rotating the region R around the y -axis. Write an integral (or a sum of integrals) that gives the volume of the spinning top. Do not evaluate your integral(s).
- b. [4 points] Another game piece has a base in the shape R , but with semicircular cross sections **perpendicular** to the x -axis. Write an integral which gives the volume of the game piece. Do not evaluate your integral.
- c. [5 points] A third game piece has volume given by $\int_0^2 \pi(h(x))^2 dx$ where $h(x)$ is a continuous function of x . Use MID(3) to approximate the volume of this third game piece. Be sure to write out all of the terms in your approximation. Your answer may contain the function $h(x)$.