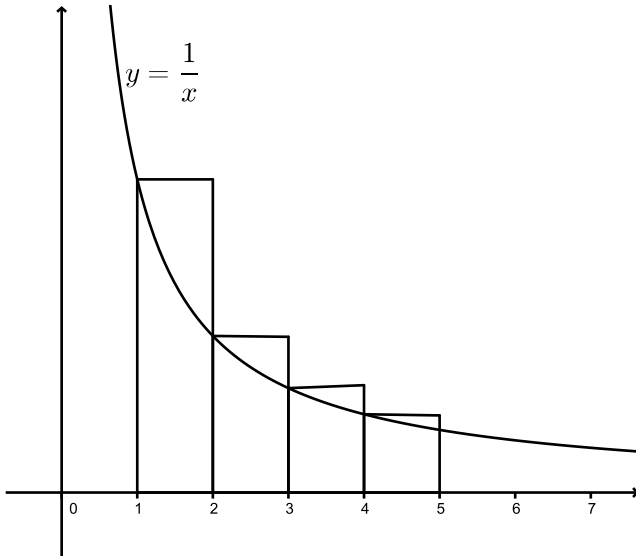
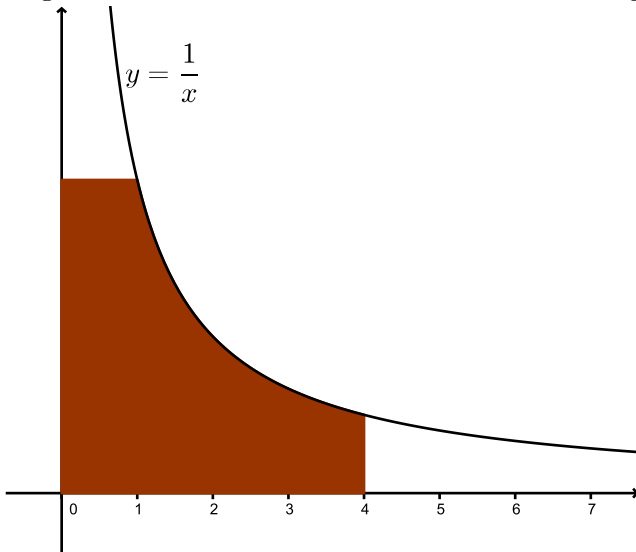


Math 31 – Workshop #18

1. Compute $\int \frac{x^3}{1-x^2} dx$.
2. Consider the region between the graph of $y = \frac{1}{x}$ and the x -axis, with $x \geq 1$. The solid obtained by rotating this region about the x -axis is called Gabriel's horn. Find the volume of Gabriel's horn.
3. (a) Find the total area of the four rectangles below.



- (b) Without actually computing $\int_1^5 \frac{1}{x} dx$, determine whether or not the result will be larger or smaller than the area of the four rectangles above. Why?
- (c) Without actually computing the area, determine if the area of the shaded region below will be larger or smaller than the area of the four rectangles above? Why?



- (d) Find the area of the shaded region above.
4. (a) Compute $\int_1^\infty \frac{1}{x^5} dx$.
 - (b) Consider $\int_1^\infty \frac{1}{x^8} dx$. Without actually computing this integral, determine if it will be larger or smaller than the integral in the previous problem. Why?