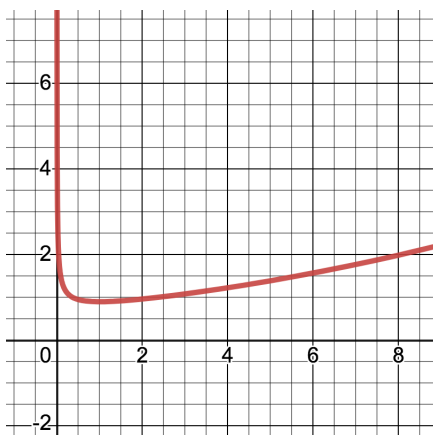


SECTION 2.1: AREA BETWEEN CURVES

1. The graph of the function $g(x) = \frac{e^{\sqrt{x}}}{3\sqrt{x}}$ is graphed below. On the same axes, sketch the graph of $f(x) = 6 - x$. Then set up an integral or integrals that will calculate the area *between* $f(x)$ and $g(x)$ on the interval from $x = 1$ to $x = 4$.



2. Theorem 2.1: Let $f(x)$ and $g(x)$ be continuous on $[a, b]$ and $f(x) \geq g(x)$ always. Then the area of the region R bounded above by _____, below by _____, on the left by _____, and on the right by _____, is given by _____.

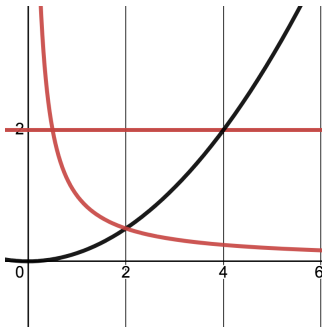
3. Sketch the region R bounded by $y = 4 - x^2$ and $y = (x - 2)^2$. Determine the points of intersection and set up an integral to calculate the area of R . Include a sample rectangle in your sketch. Evaluate the integral, if time permits.

Variations on a Theme

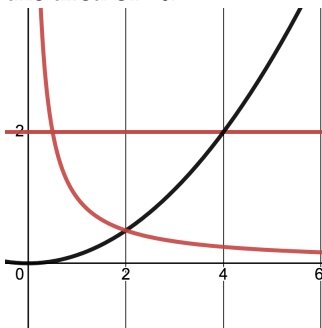
4. Sketch the region bounded by $y = x^{1/3}$, $y = 1$, $x = -8$ and $x = 8$. Include a sample rectangle in your sketch. Set up an integral to calculate its area. Evaluate the integral, if time permits.

5. Both problems below concern the same region, R (sketched below), bounded on three sides by $y = 2$, $y = \frac{1}{x}$, and $y = \frac{x^2}{8}$.

- (a) On the graph below, label each curve with its algebraic formula and the coordinates of each point of intersection. Include sample rectangles in your sketch and use them to set up two integrals to find the area of R .



- (b) On the graph below, label each curve with its algebraic formula *solved for x instead of y*, if possible. Sketch *horizontal* sample rectangles and use them to set up *one* integral that calculates the area of R .



- (c) What are the pros and cons of using vertical versus horizontal slices?