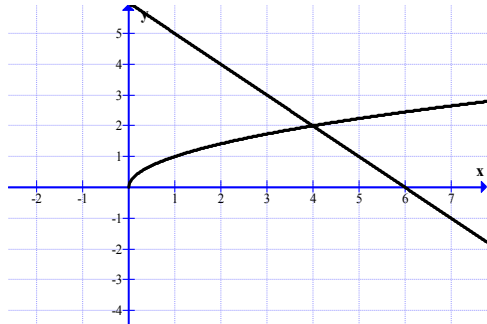


Review of Volume Problems

- 1.) Consider the region R bounded by the functions $f(x) = \sqrt{x}$ and $g(x) = 6 - x$ and the positive x -axis.



- a.) Find the area of R .
- b.) Find the volume of the solid generated by revolving R about the y -axis.
- c.) Find the volume of the solid generated by revolving R about the x -axis.
- d.) Consider a horizontal line $y = k$ which splits R into two regions (one above the line and one below). Write an equation involving one or more integrals that could be used to find the value of k if the two regions have equal area.

- 2.) Which of the following integrals has the greatest value? Explain your choice.
[Answer the question without actually taking any integrals.]

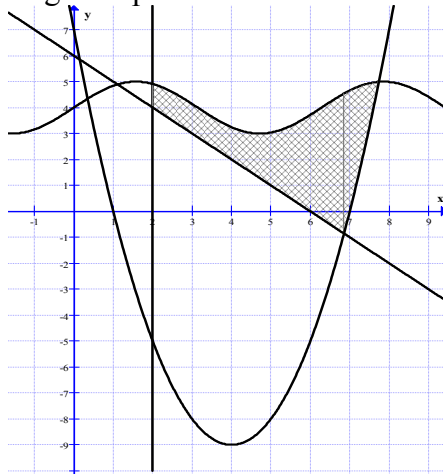
$$\int_0^{\pi/2} \sin x dx \quad \int_{\pi/4}^{3\pi/4} \sin x dx \quad \int_{\pi/2}^{\pi} \sin x dx \quad \int_0^{2\pi} \sin x dx$$

Lesson #61

3.) Consider the region S given below, bounded by these 4 curves:

$$f(x) = \sin(x) + 4 \quad g(x) = 6 - x \quad h(x) = (x - 4)^2 - 9 \quad x = 2$$

Set up an integral expression to find the area of this region. **Calculators are allowed.**



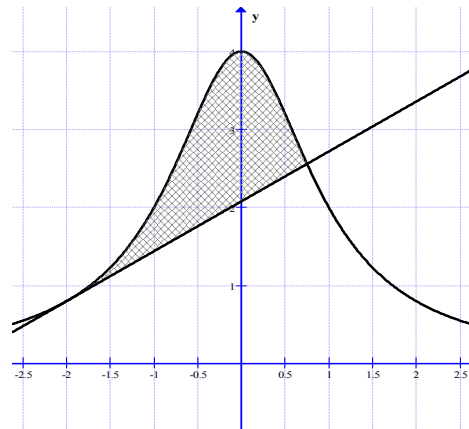
4.)

Consider the region S given in the graph

$$f(x) = \frac{4}{1 + x^2}$$

and $g(x) = 0.64x + 2.08$. You may assume that the left point of intersection of the function is $(-2, 0.8)$.

Calculators are allowed.



a.) Find the x -coordinate of the right point of intersection of the graphs above.

b.) Find the volume of the solid generated by revolving S about the line $y = -1$.

c.) Find the volume of the solid with base S whose cross-sections perpendicular to the x -axis are squares.