

FINDING THE AREA OF AN ENCLOSED REGION

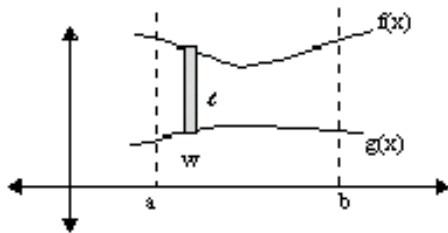
start here

Sketch a fast graph of the region taking extra care in finding the exact coordinate of the corner points of the region.

Decide if you want to pick horizontal or vertical slices. Pick some orientation that keeps each ends of the rectangle consistently on the same function. (you might need to treat the region as several pieces.)

Vertical rectangles

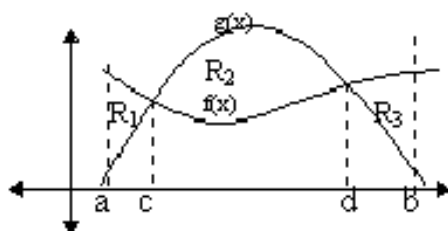
Solve each equation for y .



width = $w = dx$
 length = $l = \text{Top} - \text{Bottom}$
 $= f(x) - g(x)$

$$\text{Area} = \int_a^b [\overset{\text{top}}{f(x)} - \overset{\text{bottom}}{g(x)}] dx$$

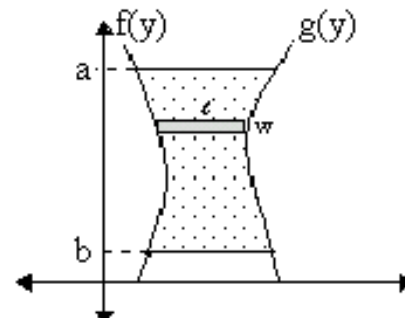
a & b are values of x that enclose the region.
 Worst Case Scenario:



Note here: $\text{Area} = R_1 + R_2 + R_3$

Horizontal rectangles

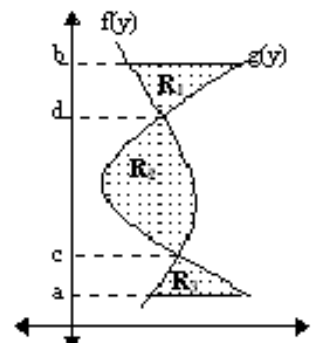
Solve each equation for x .



width = $w = dy$
 length = $l = \text{Right} - \text{Left}$
 $= g(y) - f(y)$

$$\text{Area} = \int_b^a [\overset{\text{right}}{g(y)} - \overset{\text{left}}{f(y)}] dy$$

a & b are values of y that enclose the region.
 Worst Case Scenario:



Note here: $\text{Area} = R_1 + R_2 + R_3$