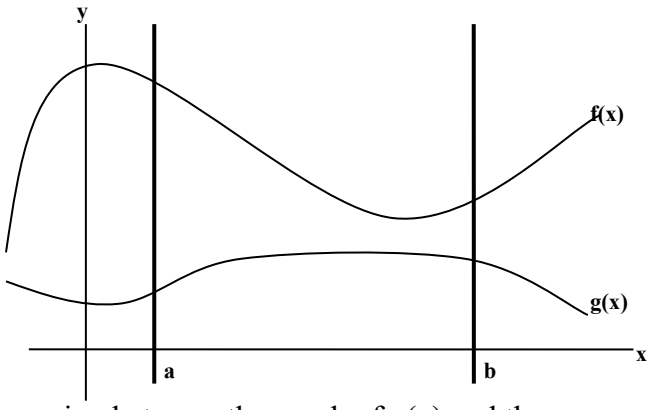
MA 182 Finding Area
Section 6.1

1. Let f and g be the functions whose graphs are shown.



(a) Write an integral that represents the area of the region between the graph of f(x) and the x-axis on the interval [a,b].

(b) Write an integral that represents the area of the region between the graph of g(x) and the x-axis on the interval [a,b].

(c) Write an integral that represents the area of the region between the graphs of f(x) and g(x) on the interval [a,b].

2. Use your answer to question #1 to set up and evaluate an integral which represents the area of the region between $y = x^2 + 4$ and $y = x + 1$ on the interval [1,5].

3. Suppose that the region in question #2 is ***lowered*** 5 units so that the new upper and lower boundaries are $y = x^2 + 4 - 5 = x^2 - 1$ and $y = x + 1 - 5 = x - 4$.

Do you think that the value of the area of the region between the two curves on the interval [1,5] will change?

Confirm your answer by setting up and evaluating an integral that represents the area of this new region.

4. In general, what must be true about functions f and g so that $\int_a^b [f(x) - g(x)]\,dx$ represents the value of the area of the region between the graphs of f and g on the interval [a,b]?

5. In this problems, you are going to find the area of the region between the graphs of the functions $y = 9 - x^2$ and $y = x^2 - 2x + 5$. To solve this problem,

(a) Since no interval is given, you must first find the points of intersection of the two functions. To do this, set the two functions equal and solve for x.

(b) Sketch a graph of the two curves on the same coordinate system so you can see what the region looks like.

(c) Set up and evaluate an integral that represents the value of the area of the given region to answer the question.

Homework:

(1) Read Examples 1, 2, 3, and 5.

(2) And Homework Problems. 1, 2, 3, 5, 7, 8, 9, 11, 13, 15, 17--20