Closing tonight: HW_2C (5.5)
Closing Wed: HW_3A, 3B (6.1, 6.2)
Closing Mon, Jan 30: HW_3C (6.3)

Exam 1 is Thursday, Jan 26th in your normal quiz section. It covers 4.9, 5.1-5.5, 6.1 and 6.2
Allowed:

- One 8.5 by 11 inch sheet of ***handwritten*** notes (front and back)
- A Ti-30x IIs calculator (this model only!)
- Pen or pencil (no red or green)
- No make-up exams.

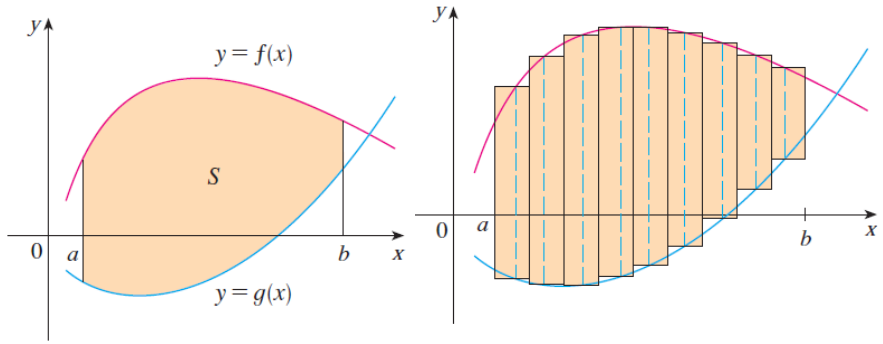
All homework is fair game. Expect problems like the homework. Know the concepts well. Practice on old exams.

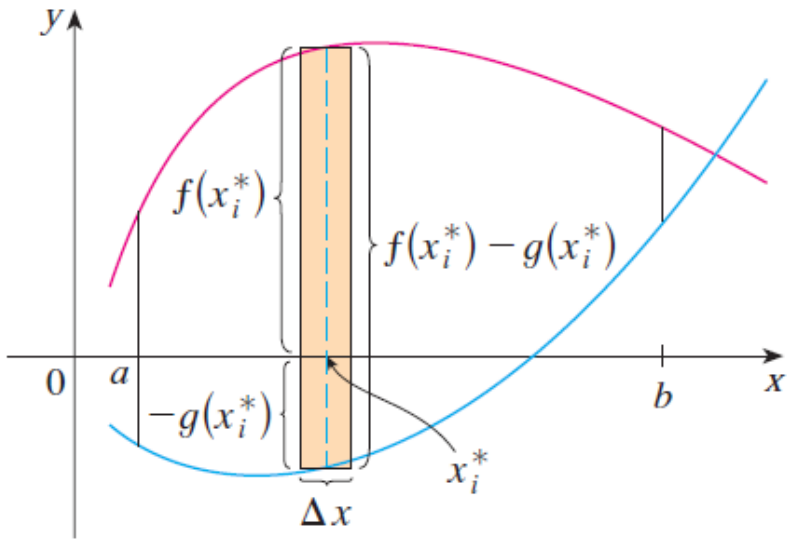
Visit office hours 1:15-3:30pm in Com B-006

Ch 6: Basic Integral Applications

6.1 Areas Between Curves

Using dx:

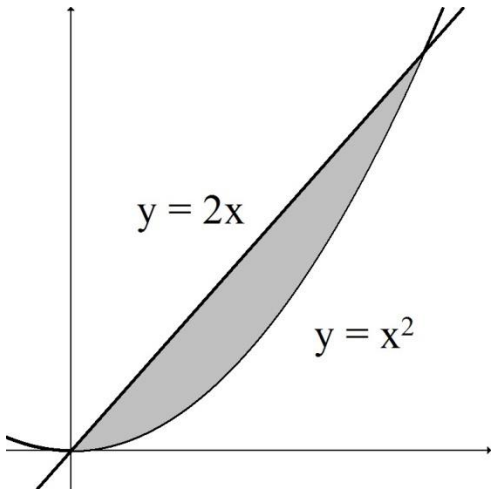




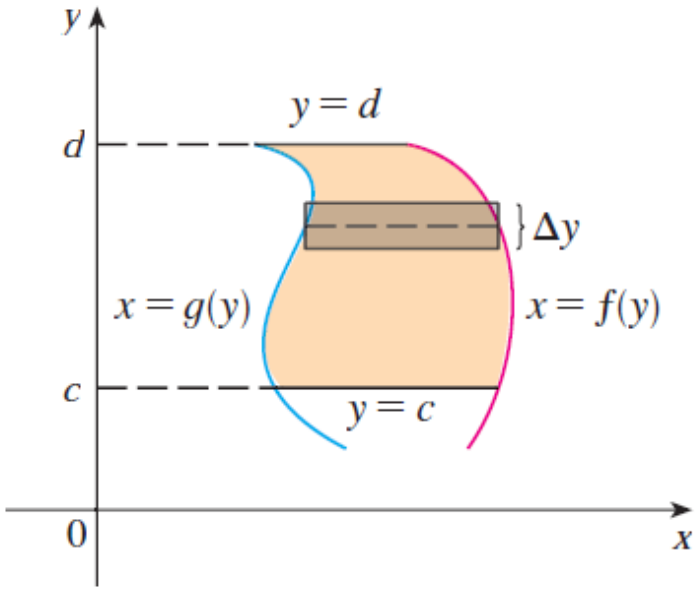
(a) Typical rectangle

$$\text{Area} = \lim_{n\to\infty} \sum_{i=1}^{n} (f(x_i) - g(x_i))\Delta x$$

Example: Find the area bounded between $y = 2x$ and $y = x^2$.

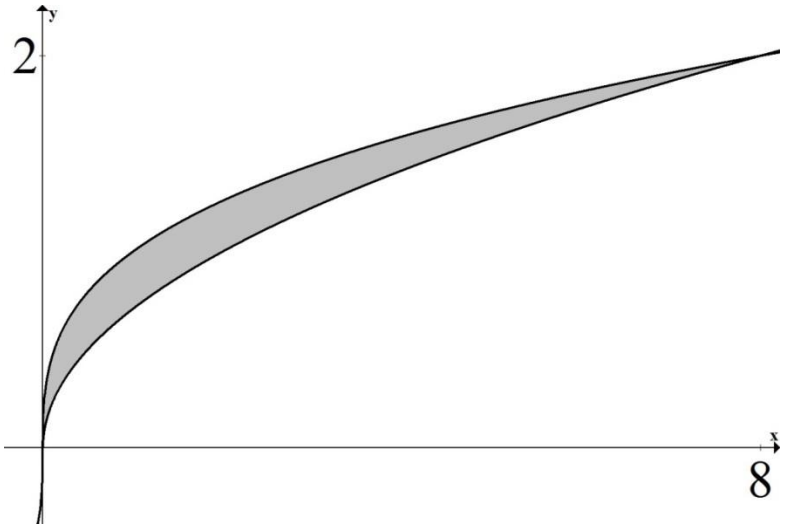


Using dy:



$$\text{Area} = \lim_{n\to\infty} \sum_{i=1}^{n} (f(y_i) - g(y_i))\Delta y$$

Example: Set up an integral for the area bounded between $x = 2y^2$ and $x = y^3$ (shown below) using dy.



Summary: The area between curves

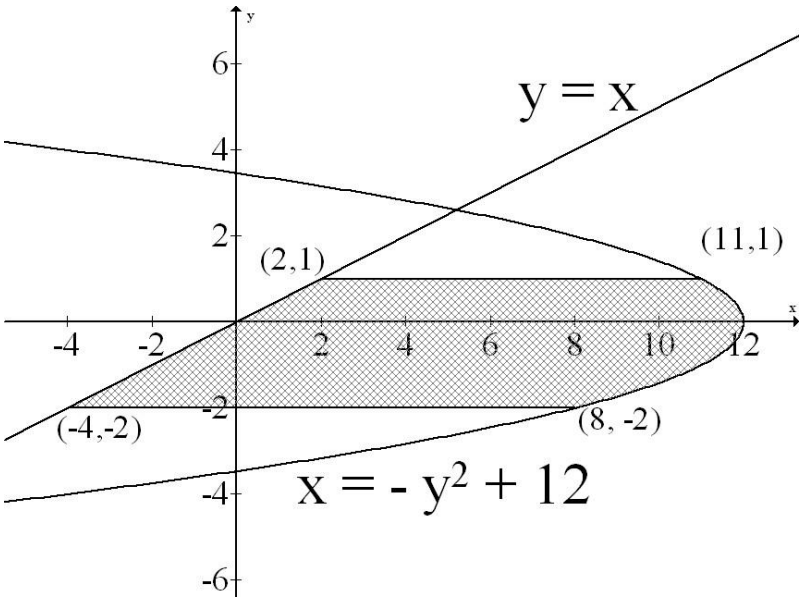
1. Draw picture finding all intersections.
   x = a = smallest x-value in region
   x = b = biggest x-value in region
   y = c = smallest y-value in region
   y = d = biggest y-value in region
2. Choose dx or dy. And get everything in terms of the variable you chose.
3. Draw a typical approx. rectangle.
4. Set up as follows:

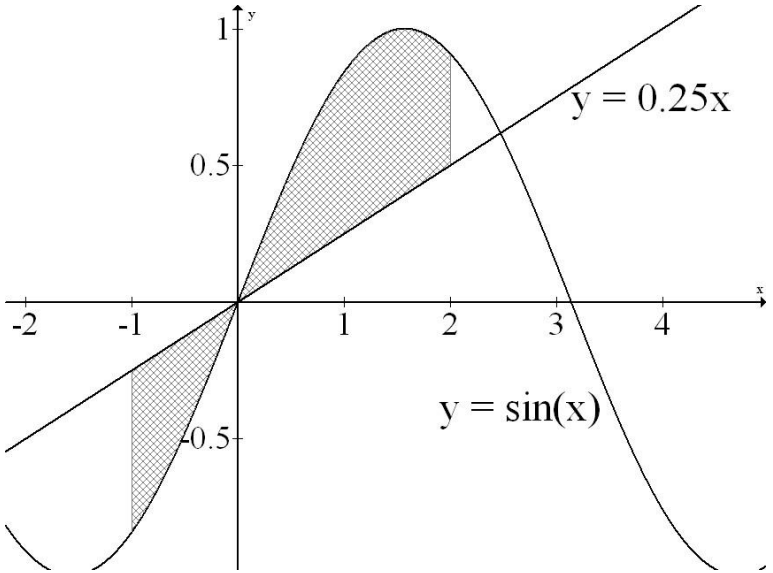
$$\text{Area} = \int_a^b (\text{TOP} - \text{BOTTOM})\, dx$$

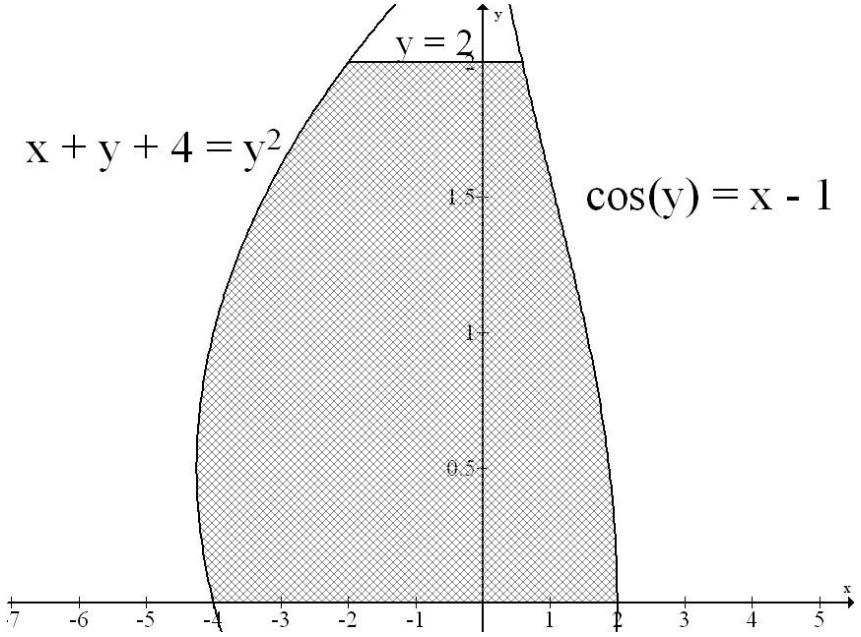
$$\text{Area} = \int_c^d (\text{RIGHT} - \text{LEFT})\, dy$$

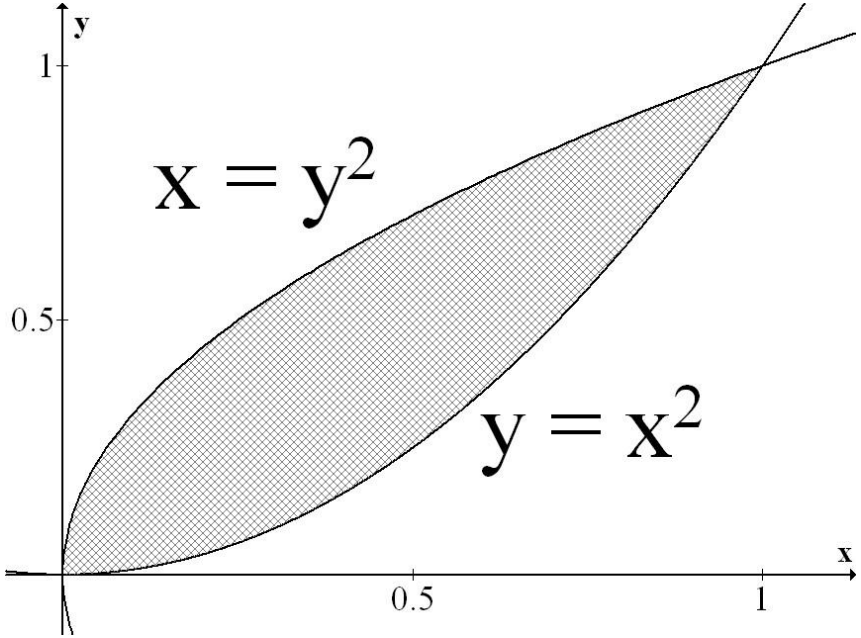
Example: Set up an integral (or integrals) that give the area of the region bounded by $x = y^2$ and $y = x - 2$

Set up an integral for the total positive area of the following regions:






y = 2
x + y + 4 = y2
cos(y) = x - 1
y
x
1.5
1
0.5
-7
-6
-5
-4
-3
-2
-1
1
2
3
4
5


y
x
1
0.5
x = y2
y = x2
0.5
1