Math 2210-1
Wed Nov. 3

HW for 11/10

14.3	7, (10), 14, (20), (27) (30), (37), (41)
14.4	4, (5), (13), (14), (23), 24, (29), (41)
14.5	(11, 13), (41, 42), 45, 46, 51

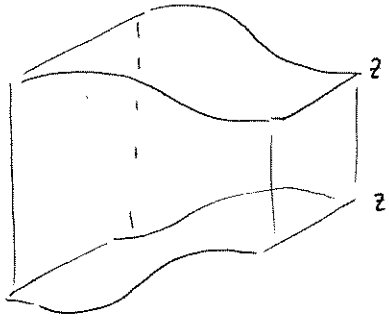
Redo your exams!
- neatly, on separate sheets, attach to original exam.
- hand back in on Monday (11/8), at start of class
- use book, notes, etc., but work on your own. (Discuss concepts or related problems with friends if you wish.)
- you can earn back up to 1/2 of the points you lost.

§14.3 Area and volume by double integration

Explain: (using Riemann sum def of integral)

- If R is a region in the plane, then its area is $\iint_R 1 \, dA$

- If R is a region in the plane
  and $z = f_1(x,y)$, $z = f_2(x,y)$, $f_1 \le f_2$
  are two graphs over R
  then the volume between the two graphs is $\iint_R [f_2(x,y) - f_1(x,y)] \, dA$



example (#2, p1011).

Find the area of the region in the x-y plane bounded between $y = x^2 - 2x$ and $y = x$. (ans = 9/2)

example (#4, p1012)

Let R be the region between
$y = x^2$
$y = 2 - x^2$

Let $f_1(x,y) = 2y$
$f_2(x,y) = 6$

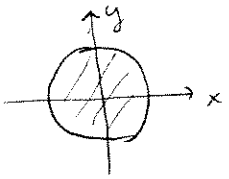
Sketch region (volume) between graphs of f_1 & f_2

Find volume.

(Ans = $\frac{32}{3}$)

Conceptual questions (p. 1012)

Deduce – without actual explicit computation –
the following double integral values. Explain.
The region R is the unit disk $x^2+y^2 \le 1$ in each case.



1. $\iint_R \sqrt{1-x^2-y^2}\, dA$

2. $\iint_R (10 - x + y)\, dA$

3. $\iint_R (1 - \sqrt{x^2+y^2})\, dA$

4. $\iint_R \sqrt{x^2+y^2}\, dA$ (use 3!)

5. $\iint_R 5 - x^2 \sin x + y^3 \cos y\, dA$.