Math 13 - Winter 2014
Homework 2
Due Wednesday, 22 Jan. 2014.

Note:

- Except for problems that are stated explicitly, all problems are from Stewart Multivariable Calculus 7th Edition.
- Please show all of your work (writing a list of answers is not sufficient).
- Please indicate the people you worked with.
- Please staple your page together.

1. Let $\mathbf{v_1}$, $\mathbf{v_2}$, and $\mathbf{v_3}$ be vectors in $\mathbb{R}^3$, where $\mathbf{v_1} = (1,1,1)$, $\mathbf{v_2} = (1,1,0)$, and $\mathbf{v_3} = (1,0,0)$ and let $L : \mathbb{R}^3 \to \mathbb{R}^3$ be the linear transformation such that
$$L(\mathbf{v_1}) = (2,-1,4),\ L(\mathbf{v_2}) = (3,0,1),\ L(\mathbf{v_3}) = (-1,5,1)$$
Find the representing matrix of L, and use that matrix to find $L(2,4,-1)$.

2. Section 15.1 (p. 1005) #4.

3. (**Corrected Jan 20, 2014**) If k is a constant $f(x,y) = k$, and $R = [a,b] \times [c,d]$, show that
$$\int\int_R k\ dA = k(b-a)(d-c).$$

4. Section 15.2 (p. 1011) #26.

5. Section 15.3 (p. 1020) #24.

6. In evaluating a double integral over a region D, a sum of iterated integrals was obtained as follows:
$$\int\int_D f(x,y)\ dA = \int_0^2 \int_0^{\sqrt{y}} f(x,y)\ dxdy + \int_2^4 \int_{y-2}^{\sqrt{y}} f(x,y)\ dxdy.$$
Sketch the region D and express the double integral as an iterated integral with reversed order of integration.