Math 323. Here are some Practice problems taken from sections 13.1-13.5, 14.1-14.3,15.1.
No calculators or notes.

Pretend this sheet is the real test and try to do the problems in 85 minutes. The purpose of this sheet is to give you an idea of the level of difficulty and the number of problems you should expect on the real test. The real test will have different problems, but as long as you understand most of what we did in class and most of the odd numbered problems from the book that I assigned (which can be found on our course web page that is linked to my web page) you should do well on the test.

1. Find $-3\vec{v} + 5\vec{w}$, where $\vec{v} = 2\vec{i} - 3\vec{k}$ and $\vec{w} = -2\vec{i} + 3\vec{j} + \vec{k}$.
2. Find the cross product of $\vec{v} = \langle 2, -3, 0\rangle$ and $\vec{w} = \langle -1, 4, 5\rangle$.
3. Is the line through $(-1, 1, 0)$ and $(5, 3, -2)$ perpendicular to the line through $(0, -1, 3)$ and $(-4, 4, -4)$?
4. Find the equation of the plane through the point $(3, 1, 0)$ and containing the line with symmetric equations $x - 2 = y/3 = (z + 1)/3$.
5. Find the parametric equations for the tangent line to the curve $\vec{r}(t) = \langle e^{t-1}, \sin(\pi t), \sqrt{3 + t}\rangle$ at the point $(1, 0, 2)$.
6. Evaluate the integral $\int_1^2 (t\, e^{t^2}\vec{i} - t^5\vec{j} + \frac{\ln t}{t}\vec{k})\, dt$.
7. Find the length of the curve $\vec{r}(t) = \langle e^t, \sqrt{2}\, t, e^{-t}\rangle$ for $0 \le t \le 3$.
8. Find the unit tangent vector $\vec{T}$, the unit normal vector $\vec{N}$ and the binormal vector $\vec{B}$ for $\vec{r}(t) = \langle \frac{\sqrt{2}}{2}t^2, t, \frac{1}{3}t^3\rangle$ when $t = 0$.
9. Find and sketch the domain of the function $f(x, y) = e^{\sqrt{x-5y}}$.
10. Draw a contour map of the function $f(x, y) = x^2 e^y$.