The exam is Thursday, November 20. It will cover sections 14.7 through 15.8 of the text. Here are some sample problems. ALSO, you should look at the problems assigned from the book and WeBWorK. Note that on the exam, some of the questions may be to just set up the integral.

1. Find the maximum of $f(x, y) = xy$ restricted to the curve $(x+1)^2+y^2 = 1$. Give both the coordinates of the point and the value of f.
2. Find the dimensions of a rectangular box of maximum volume such that the sum of the lengths of its 12 edges is a constant, C.
3. Find the absolute maximum and minimum of $f(x, y) = x^2+xy+y^2$ over the disk $\{(x, y) \mid x^2+y^2 \leq 9\}$ and where they occur.
4. Find the volume of the solid lying under the circular paraboloid $z = x^2 + y^2$ and above the rectangle $R = [-2, 2] \times [-3, 3]$.
5. Find the volume of the solid under the paraboloid $z = 3x^2+y^2$ and above the region bounded by $y = x$ and $x = y^2 - y$.
6. Evaluate $\displaystyle\iint_D x\sqrt{y^2 - x^2}\,dA$, $D = \{(x, y) \mid 0 \leq y \leq 1,\ 0 \leq x \leq y\}$.
7. Find the volume of the solid under the paraboloid $z = x^2 + y^2 + 4$ and the planes $x = 0$, $y = 0$, $z = 0$ and $x + y = 1$.
8. Find the volume of the solid bounded by the cylinders $x^2 + y^2 = r^2$ and $y^2 + z^2 = r^2$.
9. Evaluate $\displaystyle\iint_R e^{x^2+y^2}\,dA$ where $R = \{(x, y) \mid 16 \leq x^2 + y^2 \leq 25,\ x \geq 0,\ y \geq 0\}$.
10. Use polar coordinates to find the volume of the solid bounded by the paraboloid $z = 10 - 3x^2 - 3y^2$ and the plane $z = 4$.
11. Evaluate $\displaystyle\int_0^1 \int_0^z \int_0^y ze^{-y^2}\,dx\,dy\,dz$.
12. Rewrite the integral $\displaystyle\int_0^1 \int_0^{x^2} \int_0^y f(x, y, z)\,dz\,dy\,dx$ as an equivalent iterated integral in five other orders.
13. Evaluate $\displaystyle\iiint_D \pi yz \cos\left(\frac{\pi}{2}x^5\right) dV$ where $D = \{(x, y, z) \mid 1 \leq x \leq 2,\ 0 \leq y \leq x,\ x \leq z \leq 2x\}$.
14. Evaluate $\displaystyle\iiint_E x\,dV$ where E is the solid enclosed by the planes $z = 0$ and $z = x + y + 3$ and by the cylinders $x^2 + y^2 = 4$ and $x^2 + y^2 = 9$.
15. Evaluate $\displaystyle\iiint_E e^{\sqrt{x^2+y^2+z^2}}\,dV$, where E is enclosed by the sphere $x^2 + y^2 + z^2 = 9$ in the first octant.
16. Consider the two surfaces $\rho = 3\csc\theta$ in spherical coordinates and $r = 3$ in cylindrical coordinates. Are they the same surface, or different? Explain your answer.