Solutions to Homework Assignment 19

MATH 249

Section 15.1, Page 958 Stewart 6e

4, 6, 9, 11, 12

6. I will use the "upper right" corners. (This means that I will use the larger x and y values of each rectangle.) Also, notice that each rectangle is 5 by 5, so $\Delta A = 25$. I get $25[(3+4+7+8+10+8)+(4+6+8+10+12+10)+(3+4+5+6+8+7)+(2+2+2+3+4+4)] = 3500$ cubic feet. The parentheses indicate summing across rows in anticipation of 15.2. Note that I did not use all of the blue numbers in the table. Doing so would mean that I was actually choosing two numbers from the same subrectangle for some of the subrectangles.

9. (a) The midpoints of the squares are $(1,1), (1,3), (3,1)$, and $(3,3)$. The heights at these points are about 28, 5, 13, and 17, respectively. I estimated z-values between the values of the level curves. This gives $\iint_R f(x,y)dA \approx 4(28+5+13+17) = 252$. ($dA = 2(2) = 4$ since that is the area of each subrectangle.

   (b) The average value of f is about $\dfrac{1}{16}(252) = 15.75$.

11. This is just a box with base 4, width 5, and height 3; its volume is 60.

12. This is a triangular prism (a "wedge"). It volume is the area of its triangular base (which appears in the xz-plane) times its height (which is along the y-axis). The triangular base has area $\dfrac{1}{2}(5)(5) = \dfrac{25}{2}$ and the height is 3, so the volume is $\dfrac{75}{2} = 37.5$.