# Math 135, Quiz #11 Solutions, April 28, 2014

**1.** Evaluate the following sums

**a.** $\displaystyle\sum_{k=1}^{8} 2k - 1 = 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = 64.$

**b.** $\displaystyle\sum_{n=0}^{5} 2^n = 1 + 2 + 4 + 8 + 16 + 32 = 63.$

**c.** $\displaystyle\sum_{k=0}^{100} 2.$ This sum has 101 terms and they are all just the number 2. So the sum is $101 \cdot 2 = 202.$

**2.** Using left endpoints approximate $\displaystyle\int_{1}^{9} (x^2 + 1)\, dx$ using $n = 4$ rectangles.

**Solution:** First, note that $\Delta x = \frac{9-1}{4} = 2$. Our first interval is from 1 to 3 and the left endpoint is 1. So the first rectangle has area $2 \cdot (1^2 + 1) = 4$. The second interval is from 3 to 5 so the left endpoint is 3 and thus the area is $2 \cdot (3^2 + 1) = 20$. We do this twice more and the answer is:

$$2 \cdot (1^2 + 1) + 2 \cdot (3^2 + 1) + 2 \cdot (5^2 + 1) + 2 \cdot (7^2 + 1) = 4 + 20 + 52 + 100 = 176.$$