Recitation 1

1. Prove by induction on $n \geq 0$ that

$$\sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4}.$$

2. Exercise 2.2-2, page 27.

3. Arrange the following functions in order from the slowest growing function to the fastest growing function. Briefly justify your answers. (*Hint:* It may help to plot the functions and obtain an estimate of their relative growth rates. It may also help to express each function as a power of 2 and then compare.)

$$(\lg n)^{20} \qquad n^{1/4} \qquad 2^{n/100}$$