1. Determine whether each of these functions is a bijection**. If it is a bijection, prove it; if not a bijection, give a counterexample.**

   1.1 $f : R \rightarrow R$: $f(x) = 7x - 2$

   1.2 f: R → Z: f(x) = |_x_| (that is, f(x) = floor(x))

1.3 f: R → R: $f(x) = x^2$

1.4 f: {1,2,3} → {2}: {(1,2). (2,2), (3,2)}

1.5 f: {1,2,3} → {1,2, 3}: {(1,2), (1,3), (2,1), (2,2)}

2. Show that $2^x + 17$ is $O(3^x)$.

3. Let k be a positive integer. Show that $1^k + 2^k + \ldots + n^k$ is $O(n^{k+1})$.

4. Compute formula for

$$2 + \sum_{i=1}^{n} \left(3 + \sum_{j=i}^{n} 6\right)$$