

1. Prove the following by simple (weak) induction.

c.
$$\sum_{i=1}^n \frac{1}{i(i+1)} = \frac{n}{n+1}$$

b. The number of n -bit (nonnegative) binary numbers is 2^n .

2. Prove the following by strong induction.

A binary tree with n nodes has height at least $\lfloor \lg n \rfloor$.