1. Let , where *ad* > 0, be a degree-*d* polynomial in *n*, and let *k* be a constant. Use the definitions of the asymptotic notations to prove the following properties. (3-1)
2. If , then .
3. If , then .
4. If , then .
5. If , then .
6. If , then .
7. Show that the solution of is *O*(lg *n*). (4.1-1)
8. Argue that the solution to the recurrence , where c is a constant, is by appealing to a recursion tree. (4.2-2)
9. Use the master method to give tight asymptotic bounds for the following recurrences. (4.3-1)

a.

b.

c.