1. Solve the following problems from the text book, you need to show all details.
(Do NOT use masters theorem): 4-1 (textbook page 107) parts f,g

2. Solve the following problems from the text book, you need to show all details.
(Do NOT use masters theorem): 4-3 (textbook page 108) parts a,b,c,e,g

3. Use the recursion tree to give an asymptotically tight solution to the recurrence
   \[ T(n) = T(cn) + T((1-c)n) + n, \quad \text{where } 0 < c \leq 1/2 \]

4. Use a recursion tree to give an asymptotically tight solution to the recurrence
   \[ T(n) = T(\frac{n}{3}) + T(\frac{2n}{3}) + n^2 \]

5. Solve the recurrence relation
   \[ T(n) = \sqrt{n} T(\sqrt{n}) + n \]