Exercise 1 (Master Theorem)
Use the master method to give tight asymptotic bounds for the following recurrences.

1. \( T(n) = 9T\left(\frac{n}{3}\right) + n \)
2. \( T(n) = 27T\left(\frac{n}{3}\right) + n^3 \)
3. \( T(n) = 2T\left(\frac{n}{4}\right) + \sqrt{n} \)
4. \( T(n) = 2T\left(\frac{n}{2}\right) + n^2 \)
5. \( T(n) = 8T\left(\frac{n}{2}\right) + \frac{n^3}{\log n} \)

Exercise 2 (Recursion Tree Method)
1. Use a recursion tree to determine a good asymptotic upper bound on the following recurrence

\[
T(n) = 4T\left(\frac{n}{2} + 2\right) + n
\]

2. Use the substitution method to verify your answer.