COM 501 Advanced Datastructures and Algorithms `Assignment-2` Due: Feb 2

Use Substitution/recursion tree/guess/Master theorem to solve the following recurrence relations to get asymptotic upper bounds.

1. $T(n) = 3T(n/2) + n$.
2. $T(n) = 8T(n/2) + n \log n$
3. $T(n) = 9T(n/3) + n^2 \log n$
4. Use a recursion tree to give an asymptotically tight solution to the recurrence $T(n) = T(\alpha.n) + T((1-\alpha)n) + cn$, where α is a constant in the range $0 < \alpha < 1$ and $c > 0$ is also a constant.
5. Solve: $T(n) = \sqrt{T(n-1) \times T(n-2)}$
6. Solve. $T(n) = T(\frac{n}{2} + 5) + n$, $T(1) = 1$
7. Solve. $T(n) = n.T(n-1) + n(n-1)T(n-2)$, $T(1) = 1, T(2) = 2$