Q1: Show that $8n$^2 − $5n$ + 7 = $O(n$^3)

Q2: Determine whether each of these functions is bounded by O(n). Say yes or no.
a) $f(n)$ = 3
b) $f(n)$ = n^2 + n + 12
c) $f(n)$ = 17n + 7
d) $f(n)$ = 15n log n

Q3: Arrange the following functions in ascending order of growth rate.
f (n) = (1.5)^n + 50
f (n) = n^100 + n^3 log n
f (n) = (log n)^3
f (n) = √n log n
f (n) = 10^n
f (n) = n^99 + n^98
f (n) = (n!)^2

Q4: Solve the following recurrences using Master Theorem

a. $T(n) = 4T(n/2) + n^2$

b. $T(n) = 2T(n/4) + n$

Q5: In the divide and conquer closest pair of points, we sorted the coordinates (x or y). Once sorted, are we ready to start computing distances?

Q6: You are given an n×n grid representing a maze, where:

- 1 represents an open path.
- 0 represents a wall.
- The starting position is at the top-left corner (0,0).
- The goal is to reach the bottom-right corner (n-1, n-1).

Write a **backtracking function** that finds a path from the start to the goal and prints the path taken.

Example Input:

```
int maze[4][4] = {
    {1, 0, 1, 1},
    {1, 1, 1, 0},
    {0, 1, 0, 1},
    {1, 1, 1, 1}
};
```

Expected Output (One Possible Path):

(0,0) -> (1,0) -> (1,1) -> (2,1) -> (3,1) -> (3,2) -> (3,3)

Q7: B – Tree
Insertion example: Insert key 68, please show your steps. The degree if the B-Tree is t = 2