A: **Three recursion types and their characteristics**

1. **Linear Recursion:** A function calls itself once every recursive step, reducing the input size by a constant amount in each step as well.
    a. Each recursive call processes 1 element and calls itself with a smaller problem until the base case
    b. Ex: Factorial, Fibonacci, Sum of Array Elements
2. **Logarithmic Recursion:** The problem size is reduced exponentially (by half EX n -> n/2) in each recursive call.
    a. Instead of reducing the input by 1 unit, the recursion splits the problem into smaller portions, which makes it way less work overall.
    b. Ex: binary search, Exponentiation with squaring
3. **Divide and Conquer Recursion:** A problem divided into subproblems, that are each solved recursively, and then combined for the final result.
    a. Ex: Merge and quick sort, matrix multiplication