Question 1  What is the best time complexity to sort any sequence of $n$ numbers?

Question 2  What is the best time complexity to search for any number $x$ in a sorted array of $n$ numbers?

Question 3  Let $S$ be a set of size $n$. How many subsets does $S$ have?

Question 4  What is $\log_2 128$?

Question 5  You are given a sorted sequence of $n$ numbers. What is the best time complexity to construct a binary search tree for these numbers?

Question 6  What is the sum of the series $1 + 2 + \cdots + n$?

Question 7  Solve the following recurrence: $T(1) = 1$ and for each $n \geq 2$ that is a power of two, $T(n) = 2 \cdot T(n/2) + n$.

Question 8  Solve the following recurrence: $T(1) = 1$ and for each $n \geq 2$ that is a power of two, $T(n) = T(n/2) + 1$.

Question 9  Let $G$ be a graph with $n$ vertices and $n$ edges. Can $G$ be a tree?

Question 10  Let $G$ be a graph with $n$ vertices. What is the maximum number of edges that $G$ can have?

Question 11  You are given two sorted lists, each containing $n$ numbers. What is the best time complexity to merge these two lists into one sorted list?

Question 12  What is a random variable?

Question 13  You roll a fair die repeatedly until the result is 3. Let $X$ be the number of rolls. What is the expected value of $X$?