Suppose $z_1 \neq z_2$, $z_1 < z_2$ are both in an array that is the input to some recursive call of QuickSort. In each of the following cases, when are $z_1$, $z_2$ compared or not compared in the current recursive call? When are they kept together in the same subarray for the next recursive call or separated?

- $z_1$ is chosen as pivot.
- $z_2$ is chosen as pivot, $k > i$, $j$
- $z_2$ is chosen as pivot, $k < i$, $j$
- $z_2$ is chosen as pivot, $i < k < j$

What values can $X$ take? (Hint: only two possible values.)

What conditions cause each value?

What is probability of $z_1$, $z_2$ being compared?