C-2.5

There are a total of $2^L - 1$ lines of output generated. It is possible to observe this by trying a number of cases and extrapolation. We can prove this fact rigorously by induction. For the base case, observe that when $L = 0$ no lines are output. If $L \geq 1$, each of the recursive calls to $\mathsf{drawTicks}(L-1)$ generates $2^{(L-1)} - 1$ lines of output by induction. The call to $\mathsf{drawOneTick}(L)$ generates one line of output. Thus, the total number of lines is

$$(2^{(L-1)} - 1) + 1 + (2^{(L-1)} - 1) = 2 \cdot 2^{(L-1)} - 1 = 2^L - 1.$$

(Proofs by induction will be discussed in detail in Chapter ??, and are themselves recursive in nature!)