5. Let $X_1, X_2, \ldots$ be iid random variables and N a discrete random variable, independent from the X's, and let $Y = \max(X_1, \ldots, X_N)$. Express the cumulative distribution function of Y using the common cumulative distribution function of the X's and the generating function of N.

   Result. Compute $\P(Y < x)$ with total probability according to the value of N; if $F(x)$ denotes the cdf of the X_i's and $G_N(z)$ denotes the probability generating function of N, then

   $$\P(Y < x) = G_N(F(x)).$$