Exercise 7.1. Let X be a Poisson random variable with parameter $\lambda = 2$, and let Y be a geometric random variable with parameter $p = \frac{2}{3}$. Suppose that X and Y are independent, and let $Z = X + Y$. Find $P(Z = 3)$.

Exercise 9.1. Let Y be a geometric random variable with parameter $p = 1/6$.

(a) Use Markov's inequality to find an upper bound for $P(Y \geq 16)$.
(b) Use Chebyshev's inequality to find an upper bound for $P(Y \geq 16)$.
(c) Explicitly compute the probability $P(Y \geq 16)$ and compare with the upper bounds you derived.