Working with the known discrete distributions

1. Check the situation in the problem statement. Look at the questions. Are they talking about:
   (a) Getting a certain number of "successes" in n trials (Binomial)
   (b) A certain number of trials to get a "success" (Geometric)
   (c) Getting a certain number of occurrences in some frame (5 hrs etc) (Poisson)
2. Define a random variable for what the question is referring to:
   (a) X = number of successes in n trials (Binomial)
   (b) X = number of trial till first success (Geometric)
   (c) X = number of occurrences in a frame (5 hrs etc) (Poisson)
3. Write down the distribution including the numeric parameter values:
   (a) $X \sim Bin(15, .7)$
   (b) $X \sim Geo(.65)$
   (c) $X \sim Pois(4)$
4. Write down the PMF: (using part 3 above we would write)
   (a) $p_X(x) = \binom{15}{x}.7^x(1-.7)^{15-x}$
   (b) $p_X(x) = (1-.65)^{x-1}(.65)$
   (c) $p_X(x) = \frac{e^{-4}4^x}{x!}$
5. Write down the questions about your random variable in symbols: (usually easier to write them first in terms of the CDF)
   (a) Probability of less than 5 successes in 15 trials $\rightarrow \mathbb{P}(X < 5) = \mathbb{P}(X \leq 4)$
   (b) Probability 1st success comes after trial seven $\rightarrow \mathbb{P}(X > 7) = 1 - \mathbb{P}(X \leq 7)$
   (c) How many occurrences do you expect in a frame $\rightarrow \mathbb{E}(X)$
6. Use PMF, CDF or CDF tables, or Expected value/Variance formulas to get your final answer.