**Negative Binomial Distribution**

*X* is equal to the number of independent trials until the r-th success where the probability of success in any given trial is equal to *p*.

$$P(X = n) = \binom{n-1}{r-1} p^{r-1}(1-p)^{n-r}\, p \;\; , \;\; k = 0,1,2,...,n$$

Example: John and Lisa play a series of poker games until one of them wins 7 games. Suppose that the games are independent and the probability that Lisa wins a game is .60.

a) Find the probability that Lisa wins on the $10^{th}$ game.

b) Find the probability that Lisa wins.

c) Find the probability that the series ends in 10 games.

d) If the series ends in 10 games, what is the probability that Lisa wins?

.