

6. Complete the following assignment prior to Meeting #23:

- A. Study our notes from Meeting #22.
- B. Comprehend Jim's sample response to Quiz 22.
- C. Comprehend Entry #044A-E of our *Glossary*.
- D. From the Video Page of *Canvas*, view with comprehension the videos named "geometric random variables," "negative binomial distribution," "hypergeometric distributions," and "Poisson process 1 probability and statistics Kahn Academy."
- E\*. Please solve the following problems; display the computations, and upload the resulting pdf document on the appropriate Canvas assignment link:
  - i. A person is randomly selected from a population and tested for COVID-19 infection. A positive test result is labeled a "success" and coded as 1; a negative test result is labeled a "failure" and coded as 0. If the first person selected is infected, then the experiment is completed. If the first person is not infected, the experiment continues. This process is repeated until an infected person is selected. As of May 26, 2020, one seemingly credible estimate is 30% of the people worldwide are infected; use that figure for this problem. Compute the probability that exactly 4 trials are executed before an infected person is identified.
  - ii. Five cards are randomly selected from a standard 52-card poker deck and this is done *without replacement*. Determine the probability that exactly two of the selected cards are red.
- E. Comprehend Jim's sample responses to the homework prompts that are posted on *Canvas*.

i) This is geometric, with probability of success = .3

$$P(k) = (1-p)^{k-1}(p) \quad P(4) = (1-.3)^3(.3) = .1029$$

ii) This is hypergeometric.

$$P(X=x) = \frac{\binom{k}{x} \binom{N-k}{n-x}}{\binom{N}{n}} \quad P(X=2) = \frac{\binom{26}{2} \binom{52-26}{5-2}}{\binom{52}{5}} = .3252$$