Formulas

- $P(E) = \frac{\text{Number of outcomes in } E}{\text{Total number of outcomes}}$ if outcomes in the sample space are equally likely.
- $P(E) + P(E') = 1$
- $P(A \text{ and } B) = P(A) \cdot P(B \mid A)$
- $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
- $nP_r = \frac{n!}{(n-r)!}$

- Ways to order $n$ objects with $n_1$ alike, $n_2$ alike, . . . , and $n_k$ alike = $\frac{n!}{n_1! n_2! \cdots n_k!}$ (Given)
- $nC_r = \frac{n!}{(n-r)! r!}$
- $\mu = E(x) = \sum xP(x)$
- $\sigma^2 = \sum(x-\mu)^2P(x)$ (Given)
- Binomial:
  - $P(x) = \frac{n!}{(n-x)! x!} p^x \cdot q^{n-x}$ (Given)
  - $\mu = np$
  - $\sigma^2 = npq$
- Geometric:
  - $P(x) = p \cdot q^{x-1}$ (Given)
  - $\mu = \frac{1}{p}$
  - $\sigma^2 = \frac{1-p}{p^2}$ (Not needed)
- Poisson:
  - $P(x) = \frac{\mu^x e^{-\mu}}{x!}$ (Given)
  - $\mu = \sigma^2 = \mu$ (Not needed)