

Pointers – Section 6.2

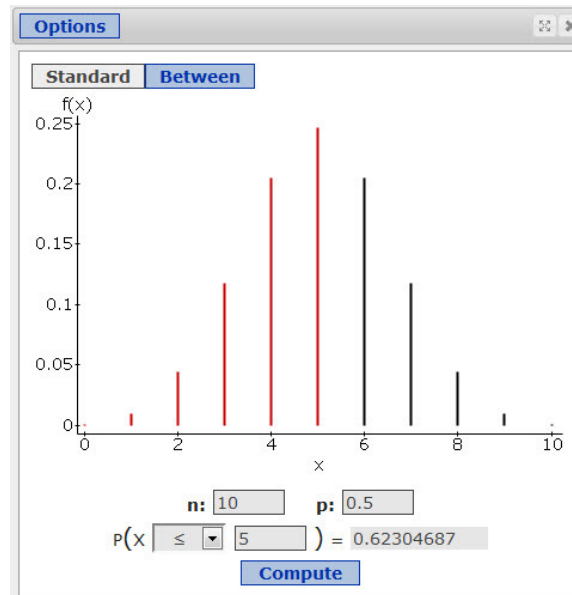
This section deals with one particular type of probability – the **binomial probability distribution**.

There are 4 criteria required for a problem to be considered binomial.

1. There are a fixed (finite) number of trials n .
2. The trials are independent. (The outcome of one trial does not affect the probability of the next trial.)
3. There are two possible outcomes for each trial: failure and success.
4. The probability of success (p) for each trial stays the same.

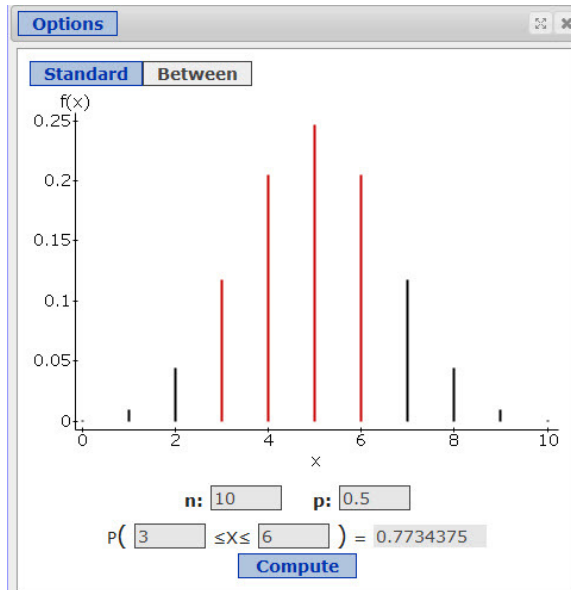
For calculating binomial probabilities we use the binomial calculator in StatCrunch.

Stat > Calculators > Binomial



For each problem, first determine the number of trials (n) and the probability of success (p). Enter them in the appropriately labeled boxes. Next determine what number of successes (x) you are looking for. Be careful when determining the sign, keep on the lookout for phrases like “more than”, “less than”, “at least”, “at most”, ... Fill in the remaining boxes and press Compute.

Occasionally you will be asked to find the probability that x is between a and b . In that case, click on the “Between” button on the calculator and fill in the boxes.



Mean & Standard Deviation

There are two easier to use formulas for the mean and standard deviation of a binomial probability distribution.

$$\mu_x = n \cdot p$$

$$\sigma_x = \sqrt{n \cdot p \cdot (1 - p)}$$

Unusual Results

A result is considered to be unusual if it is less than $\mu - 2\sigma$ or greater than $\mu + 2\sigma$. According to the Empirical Rule, this happens less than 5% of the time.