

Definitions

Geometric Setting

- A **geometric setting** is a situation in which a series of trials are performed testing a chance process and the number of trials performed before a success occurs.
- There are **three conditions** that must be true for a situation to be geometric:
 - ▷ **Binary** - Each trial has only two possible outcomes.
 - ▷ **Independent** - The trials must be independent.
 - ▷ **Success** - Each trial has the same probability of success.

Geometric distribution

- **Geometric random variable** - the number of trials, Y , required for a success.
- **Geometric distribution** - the probability of getting a success in Y trials. The parameter is:
 - ▷ p , the **probability** of a success in each trial.

Calculating Probabilities

- **Geometric Probability, $P(Y = k)$** - the probability of getting a success on the k th trial.

$$P(Y = k) = p(1 - p)^{k-1}$$

k - number of trials until a success; p - probability of success in a single trial

- **Mean, μ_Y**

$$\mu_Y = \frac{1}{p}$$

Calculator Note

On your graphing calculator, two functions will calculate a geometric probability:

- **geometpdf** $P(Y = k)$
- **geometcdf** $P(Y \leq k)$