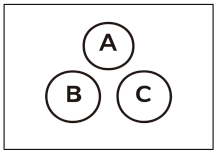
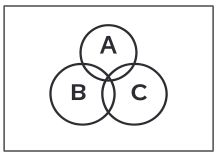
A Cumulative Distribution Function A



$N = 5$

$K = 3$

$n = 2$



$$P(X = k) = \binom{3}{k}\binom{2}{2-k}/\binom{5}{2} = \binom{3}{k}\binom{2}{2-k}/10$$

$$P(X = 0) = \binom{3}{0}\binom{2}{2}/10 = 1/10 = 0.10$$

$$P(X = 1) = \binom{3}{1}\binom{2}{1}/10 = 6/10 = 0.60$$

$$P(X = 2) = \binom{3}{2}\binom{2}{0}/10 = 3/10 = 0.30$$

$F(0) = 0.10$

$F(1) = 0.10 + 0.60 = 0.70$

$F(2) = 1$

$N = 25$

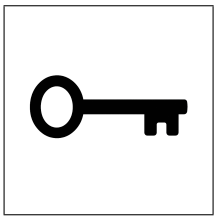
$K = 20$

$n = 3$

$PMF = ?$

$CDF = ?$

A Cumulative Distribution Function A



$N = 25$
$K = 20$
$n = 3$
$PMF = ?$
$CDF = ?$

$$P(X = k) = \binom{K}{k}\binom{N-K}{n-k} / \binom{N}{n}$$

$$P(X = 0) = \binom{5}{0}\binom{20}{3} / \binom{25}{3} = \frac{1140}{2300} = 0.4957$$

$$P(X = 1) = \binom{5}{1}\binom{20}{2} / \binom{25}{3} = \frac{950}{2300} = 0.4130$$

$$P(X = 2) = \binom{5}{2}\binom{20}{1} / \binom{25}{3} = \frac{200}{2300} = 0.0869$$

$$P(X = 3) = \binom{5}{3}\binom{20}{0} / \binom{25}{3} = \frac{10}{2300} = 0.0043$$

$F(0) = P(X = 0)$
$F(0) = 1140/2300 = 0.4957$

$F(1) = P(X \leq 1) = P(X = 0) + P(X = 1)$
$F(1) = 1140 + 950/2300 = 0.9087$

$F(2) = P(X \leq 2) = P(X = 0) + P(X = 1) + P(X = 2)$
$F(2) = 1140 + 950 + 200/2300 = 0.9957$

$F(3) = P(X \leq 3) = P(X = 0) + P(X = 1) + P(X = 2) + P(X = 3)$
$F(3) = 1140 + 950 + 200 + 10/2300 = 1$