

Year 1 Applied Chapter 6 – Statistical Distribution

Probability Distributions

Tables

X	1	2	3	4	
$P(X=x)$	0.2	0.2	0.5	0.5	$= 1$

Functions

$$P(X=x) = \begin{cases} 0.2 & x=1,2 \\ 0.5 & x=3 \\ 0.1 & x=4 \end{cases}$$

Binomial Distribution

$$X \sim B(n, p)$$

n = number trials

p = probability of success

r = number of success required

$$P(X=r) = \binom{n}{r} p^r (1-p)^{n-r}$$

where

$$\binom{n}{r} = {}^n C_r = \frac{n!}{r!(n-r)!}$$

Binomial PD and CD

Classwiz Calculator

menu

STAT

DIST

Bpd

or

Bcd

Data: variable

$P(X=x)$ Binomial PD

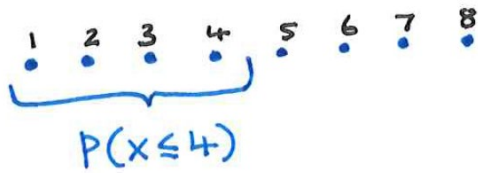
menu
7
4: Binomial PD
2: Variable

$P(X \leq x)$ Binomial CD

menu
7
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1: Binomial CD
2: Variable

Watch out for $\geq$

$$P(X \geq 5) = 1 - P(X \leq 4)$$



$$N = 8 \quad P = 0.55$$

$$P(X = 0) = 0.00168$$

$$P(X = 1) = 0.00164$$

$$P(X = 2) = 0.0703$$

$$P(X = 3) = 0.172$$

$$P(X = 4) = 0.262$$

$$P(X = 5) = 0.257$$

$$P(X = 6) = 0.157$$

$$P(X = 7) = 0.0548$$

$$P(X = 8) = 0.00837$$

$$P(X \leq 4) = 0.523$$

$$P(X \geq 5) = 1 - P(X \leq 4) = 0.477$$

Example (PD)

Total outcomes (N) = 8

Probability of success (P) = 0.55

What is the probability of
0 success out of 8?

$$P(X = 0) = 0.00168$$

Example (CD)

Total outcomes (N) = 8

Probability of success (P) = 0.55

What is the probability of
3 success or less out of 8?

$$P(X \leq 3) = 0.260$$