

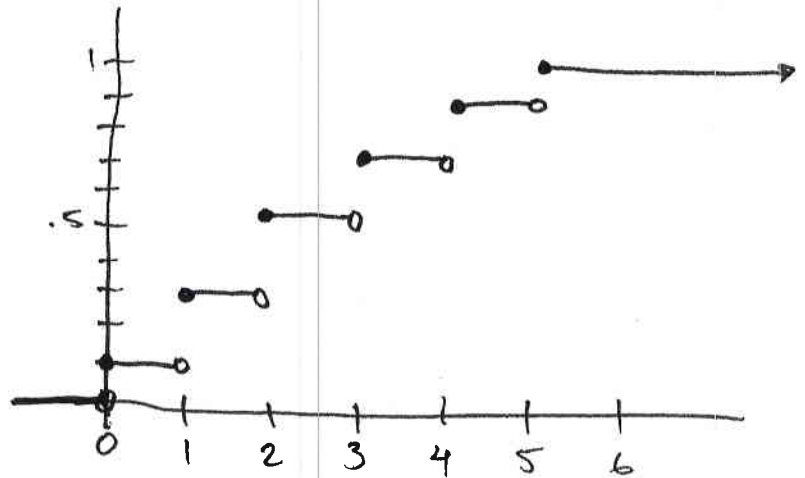
Instructions: Show all work. State any formulas used. If you use the calculator, you should say which function you used, and what you entered into it, as well as any output. I can only give partial correct for incorrect answers if I have something to grade.

1. Below is a discrete probability distribution. Find the cumulative distribution from it, and graph the resulting function.

x	0	1	2	3	4	5
$p(x)$	0.1	0.2	0.25	0.2	0.15	0.1

Or a table

$$F(x) = \begin{cases} 0 & x < 0 \\ 0.1 & 0 \leq x < 1 \\ 0.3 & 1 \leq x < 2 \\ 0.55 & 2 \leq x < 3 \\ 0.75 & 3 \leq x < 4 \\ 0.9 & 4 \leq x < 5 \\ 1 & x \geq 5 \end{cases}$$



2. For a binomial distribution with 25 trials, and $p = 0.7$ find the following:

a) Equation of the distribution.

$$b(x; 25, 0.7) = \binom{25}{x} (.7)^x (.3)^{25-x}$$

b) $P(X = 4)$

$$\binom{25}{4} (.7)^4 (.3)^{21} \text{ or binomial pdf } (25, .7, 4) = 3.177 \times 10^{-8}$$

c) $P(X \geq 2)$

$$1 - \left[\binom{25}{0} (.7)^0 (.3)^{25} + \binom{25}{1} (.7)^1 (.3)^{24} \right] = 1 - \text{binomialcdf}(25, .7, 1) =$$

$$1 - 5.027 \times 10^{-12} = .9999999999949727 \dots \text{ basically } 1$$

d) What is the mean and variance of the distribution?

$$E(X) = np = 25(.7) = 17.5$$

$$V(X) = np(1-p) = 25(.7)(.3) = 5.25$$