Section 3.1: Discrete Random Variables

Wednesday, May 27, 2015
3:00 PM

a variable x is a discrete random variable if the value x assumes in the outcome of an experiment is a chance or random event

discrete → quantitative, and behaves like the integers (there is a minimum "step" between quantities)

the probability distribution for a discrete random variable is a formula, graph, or table that gives the possible values of x and their associated probabilities $p(x)$

note: the values of x must be mutually exclusive events

also: $0 \leq p(x) \leq 1$

$\Sigma p(x) = 1$

example: Two 4-sided dice are rolled. Calculate the probability distribution for the sum of the two rolls.

brute force:

11	12	13	14
21	22	23	24
31	32	33	34
41	42	43	44

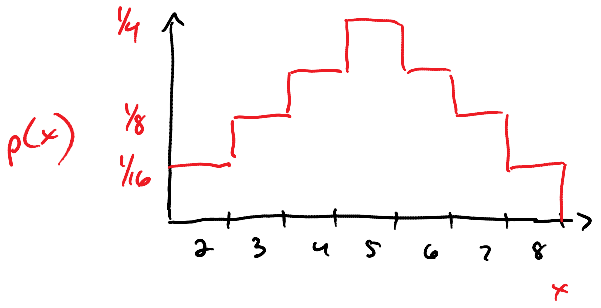
total numbers of events: 16

x (sum)	p(x)
2	1/16
3	2/16
4	3/16
5	4/16
6	3/16

perfectly acceptable answer #1

5	4/16
6	3/16
7	2/16
8	1/16

we can also graph this:



perfectly acceptable answer #2

What is the average value of x?

population mean - also called the "expectation value" or "expected value" of x

mean

$$\mu = E(x) = \Sigma \, x \, p(x)$$