$X \sim \text{Bern}(p)$ coin toss (with $\Pr[H] = p$)

$X \sim \text{Binom}(n, p)$ sum of n iid $\text{Bern}(p)$ RVs.

$\Pr[X = 4]$ what's prob of exactly 4 successes in n trials

$X \sim \text{Geom}(p)$ waiting time till 1st H in a coin toss

make some trials, you fail w.p. $(1-p)$ succeed w.p. p

what is the time till 1st success?

$\Pr[H] = 0.2$

T T (H) H T $X = 3$

(H) T T $X = 1$

T T T T T T T T (H) $X = 9$

# of successes

$X \sim \text{Poisson}(\lambda)$

rate
arrivals / time

3 ppl / min $\Pr[X = 4]$ what's prob that exactly 4 ppl arrive in 1 min

5 families / hr

10 atoms / sec $\Pr[X = 5]$ what's prob that exactly 5 atoms decay in 1 sec

$i \cdot j \equiv k \pmod{p}$ $k \neq 0$

$j \equiv i^{-1} \circ k \pmod{p}$

$\dfrac{p-1}{p^2}$