r.v. X : $p(X=k) = \binom{n}{k} p^k (1-p)^{n-k} \approx e^{-\lambda} \frac{\lambda^k}{k!}$

Note Title 8/29/2013

$\lambda \equiv n \cdot p$

$F_X(x) \equiv P(X \le x) = 1 - e^{-\lambda x}$

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phone call · r.v. X : time between two phone calls

inter-arrival

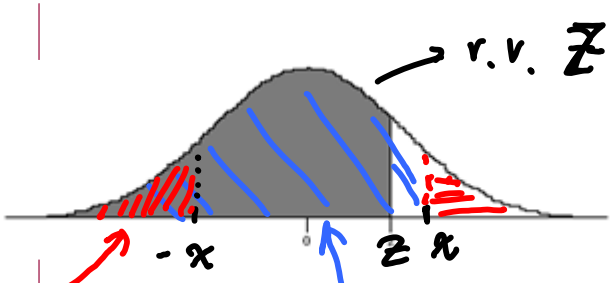
X can be treated either continuously or discretely

r.v. X ~ geometric ← discrete

~ exponential ← continuous

r.v. $X_i \sim$ exp distn.

r.v. $Y = X_1 + X_2 + X_3$ if X_i independent, then $Y \sim$ 3rd-order Erlang



$P(Z \le -x)$

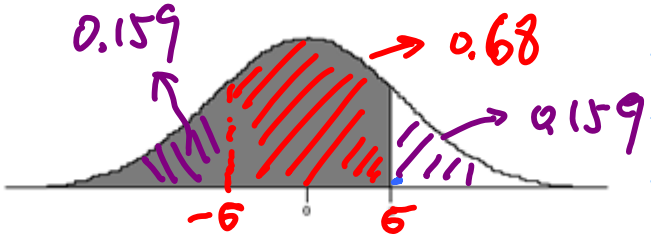
$= 1 - P(Z \le x)$

$\Phi(x) = P(Z \le x)$

$\Rightarrow \Phi(-x) = 1 - \Phi(x)$

z	F(x)	z	F(x)	z	F(x)
-2.5	0.006	-1	0.159	0.5	0.691
-2.4	0.008	-0.9	0.184	0.6	0.726
-2.3	0.011	-0.8	0.212	0.7	0.758
-2.2	0.014	-0.7	0.242	0.8	0.788
-2.1	0.018	-0.6	0.274	0.9	0.816
-2	0.023	-0.5	0.309	1	0.841
-1.9	0.029	-0.4	0.345	1.1	0.864
-1.8	0.036	-0.3	0.382	1.2	0.885
-1.7	0.045	-0.2	0.421	1.3	0.903
-1.6	0.055	-0.1	0.46	1.4	0.919
-1.5	0.067	0	0.5	1.5	0.933
-1.4	0.081	0.1	0.54	1.6	0.945
-1.3	0.097	0.2	0.579	1.7	0.955
-1.2	0.115	0.3	0.618	1.8	0.964
-1.1	0.136	0.4	0.655	1.9	0.971

2 0.977



Student height $\sim N(170, 10^2)$

68% of students have height between 160cm to 180cm

95% 150cm ~ 190cm