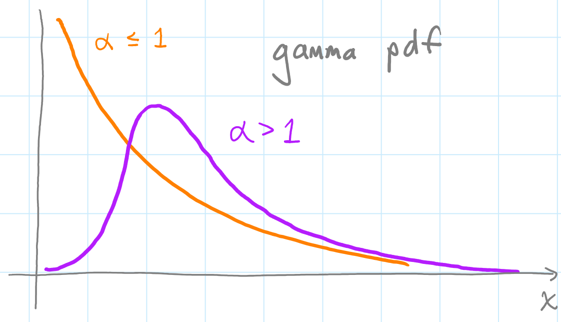
GAMMA DISTRIBUTION

$X \sim \text{Gamma}(\alpha, \beta)$ has pdf $f(x;\alpha,\beta) = \begin{cases} \frac{1}{\beta^\alpha \Gamma(\alpha)} x^{\alpha-1} e^{-x/\beta} & \text{if } x > 0 \\ 0 & \text{if } x \le 0 \end{cases}$

mean: $E(X) = \alpha\beta$

variance: $Var(X) = \alpha\beta^2$

mgf: $M_X(t) = \frac{1}{(1-\beta t)^\alpha}, \quad t < \frac{1}{\beta}$



If $\alpha = n$ an integer, then $X \sim \text{Gamma}(n, \beta)$ gives the time until the n^{th} occurance in a poisson process with rate $\frac{1}{\beta}$.

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