

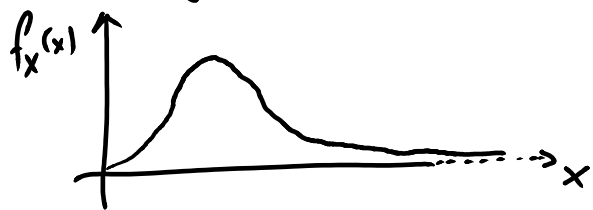
A couple more facts about Gamma random variables:

Exponential random variables have the memoryless property BUT Gamma random variables only have the memoryless property if they are actually Exponential random variables, i.e. only if $r=1$.

Similarly the minimum of independent Exponential random variables is also an Exponential random variable.

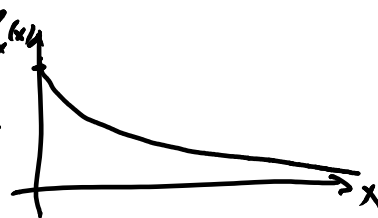
It is not the case for Gamma random variables (unless, again, $r=1$ so they are really Exponential random variables)

The density of a Gamma random variable looks like:



if $r \geq 2$, or

if $r=1$:



Remember: An Exponential random variable is a Gamma random variable with $r=1$.