$$\begin{aligned} \operatorname{Gamma}(x\mid \operatorname{shape} &=\alpha, \operatorname{rate} &=\beta) = \frac{\beta^{\alpha}}{\Gamma(\alpha)} x^{\alpha-1} e^{-\beta x} \\ \operatorname{Inv-Gamma}(x\mid \operatorname{shape} &=\alpha, \operatorname{rate} &=\beta) = \frac{1}{\beta^{\alpha} \Gamma(\alpha)} x^{-(\alpha+1)} e^{-1/\beta x} \end{aligned}$$