

$$\begin{aligned} \text{ORIGIN} &:= 1 \\ X &:= \begin{pmatrix} 30.4 \\ 278.7 \\ 63.9 \\ 387.1 \\ 330 \\ 187.3 \\ 495.9 \\ 18 \\ 163.3 \\ 128.8 \end{pmatrix} & X_{\text{mean}} &:= \text{mean}(X) = 208.34 & \text{LNX} &:= \ln(X) = \begin{pmatrix} 3.414 \\ 5.63 \\ 4.157 \\ 5.959 \\ 5.799 \\ 5.233 \\ 6.206 \\ 2.89 \\ 5.096 \\ 4.858 \end{pmatrix} \\ & & \text{LNX}_{\text{mean}} &:= \text{mean}(\text{LNX}) = 4.924 \end{aligned}$$

$$A := \ln(X_{\text{mean}}) - \text{LNX}_{\text{mean}} = 0.4149$$

$$\alpha := \left(\frac{1}{4 \cdot A} \right) \cdot \left(1 + \sqrt{1 + 4 \cdot \frac{A}{3}} \right) = 1.3536$$

$$\beta := \frac{\text{mean}(X)}{\alpha} = 153.918$$

$$g(x) := \left(\frac{1}{\beta^\alpha \cdot \Gamma(\alpha)} \right) \cdot \left(x^{\alpha-1} \cdot e^{-\frac{x}{\beta}} \right) \quad \text{Eqn 1} \quad \Gamma\left(\frac{1}{2}\right) = 1.7725 \quad \Gamma(\alpha) = 0.8908$$

$$G(x_{\text{val}}) := \left(\frac{1}{\beta^\alpha \cdot \Gamma(\alpha)} \right) \cdot \int_0^{x_{\text{val}}} x^{\alpha-1} \cdot e^{-\frac{x}{\beta}} dx \quad \text{Eqn 2}$$

$$Q(x_{\text{val}}) := \int_0^{x_{\text{val}}} g(x) dx \quad \text{Eqn 3} \quad \alpha = 1.35358217 \quad \beta = 153.91751239$$

$$X = \begin{pmatrix} 30.4 \\ 278.7 \\ 63.9 \\ 387.1 \\ 330 \\ 187.3 \\ 495.9 \\ 18 \\ 163.3 \\ 128.8 \end{pmatrix} \xrightarrow{\quad} g(X) = \begin{pmatrix} 0.0034 \\ 0.0015 \\ 0.0035 \\ 0.0008 \\ 0.0011 \\ 0.0023 \\ 0.0004 \\ 0.003 \\ 0.0026 \\ 0.003 \end{pmatrix} \xrightarrow{\quad} G(X) = \begin{pmatrix} 0.0825 \\ 0.7385 \\ 0.2 \\ 0.8595 \\ 0.8046 \\ 0.5676 \\ 0.9259 \\ 0.0425 \\ 0.5089 \\ 0.4133 \end{pmatrix} \xrightarrow{\quad} Q(X) = \begin{pmatrix} 0.0825 \\ 0.7385 \\ 0.2 \\ 0.8595 \\ 0.8046 \\ 0.5676 \\ 0.9259 \\ 0.0425 \\ 0.5089 \\ 0.4133 \end{pmatrix}$$