gumbel

$$\underbrace{F_{X_m}(x_m)}_{u_k} = \exp\left[-e^{-\alpha_m(x_m-u_m)}\right]$$

$$\ln u_k = -\exp\left[-\alpha_m(x_m-u_m)\right]$$

$$\ln\left[\ln\left(\frac{1}{u_k}\right)\right] = -\alpha_m(x_m-u_m)$$

$$x_m = u_m - \frac{1}{\alpha_m}\cdot\ln\left[\ln\left(\frac{1}{u_k}\right)\right]$$

Weibull

$$\underbrace{F_{X_1}(x_1)}_{u_k} = 1 - \exp\left[\left(\frac{x_1 - \varepsilon}{w_1 - \varepsilon}\right)^k\right]$$

$$\ln(1 - u_k) = \left[\frac{(x_1 - \varepsilon)}{(w_1 - \varepsilon)}\right]^k$$

$$x_1 = \left[\ln(1 - u_k)\right]^{\frac{1}{k}} (w_1 - \varepsilon)$$

Frechet

$$\underbrace{F_{x_m}(x_m)}_{\mu_k} = \exp\left[-\left(\frac{\gamma_m}{x_m}\right)^{\frac{1}{k}}\right]$$

$$\ln(\mu_k) = -\left(\frac{\gamma_m}{x_m}\right)^{k}$$

$$\left[\ln\left(\frac{1}{\mu_k}\right)\right]^{1/k} = \frac{\gamma_m}{x_m}$$

$$x_m = \frac{\gamma_m}{\left[\ln\left(\frac{1}{\mu_k}\right)\right]^{1/k}}$$

Lognormal

$$z_k = \frac{\ln x_k - \lambda_X}{\zeta_X}$$

$$z_k \cdot \zeta_X + \lambda_X = \ln x_k$$

$$x_k = \exp\left(\lambda_X + z_k \zeta_X\right)$$

Normal

$$x_m = \mu_x + z_m \cdot \sigma_x$$