Képletek az **L** és **S** anyagrészek feladatainak megoldásához

$$\sum (x_i - \bar{x}) = 0$$

$$Q = \sum (x_i - \bar{x})^2$$

$$s = \sqrt{\frac{Q}{n-1}}$$

$$\bar{x}_w = \frac{\sum w_i x_i}{\sum w_i}$$

$$Q = \sum x_i^2 - \frac{(\sum x_i)^2}{n}$$

$$V = \frac{s}{\bar{x}} 100$$

$$\bar{x}_g = \sqrt[n]{x_1 x_2 x_3 \cdots x_n}$$

$$s_e^2 = \frac{\sum_{j=1}^{k} Q_j}{\sum_{j=1}^{k} (n_j - 1)}$$

$$s_e^2 = \frac{\sum_{j=1}^{k} d_j^2}{2k}$$

$$\bar{x}_h = \frac{n}{\sum \frac{1}{x_i}}$$

$$\bar{x}_q = \sqrt{\frac{\sum x_i^2}{n}}$$

$$s_{\bar{x}} = \frac{s}{\sqrt{n}}$$

$$Q_h = \sum (y_i - (a + bx_i))^2$$

$$Q_{xy} = \sum (x_i - \bar{x})(y_i - \bar{y})$$

$$a = \bar{y} - b\bar{x}$$

$$Q_h = Q_y - Q_r$$

$$Q_{xy} = \sum x_i y_i - \frac{(\sum x_i)(\sum y_i)}{n}$$

$$b = \frac{Q_{xy}}{Q_x}$$

$$Q_r = \frac{Q_{xy}^2}{Q_x}$$

$$s_{xy} = \frac{Q_{xy}}{n-1}$$

$$r = \frac{Q_{xy}}{\sqrt{Q_x Q_y}}$$

$$y = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

$$t = \frac{\bar{x} - \mu}{s_{\bar{x}}}$$

$$t = \frac{\bar{x}}{s_{\bar{x}}}$$

$$z_i = \frac{x_i - \mu}{\sigma}$$

$$F = \frac{s_1^2}{s_2^2}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_e \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$\bar{x} - t_p s_{\bar{x}} \le \mu \le \bar{x} + t_p s_{\bar{x}}$$

$$\frac{Q}{\chi_f^2} \le \sigma^2 \le \frac{Q}{\chi_a^2}$$

$$d = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$r_{xy \cdot z} = \frac{r_{xy} - r_{xz} r_{yz}}{\sqrt{(1 - r_{xz}^2)(1 - r_{yz}^2)}}$$

$$t = r\sqrt{\frac{n-2}{1-r^2}}$$

$$F = \frac{s_r^2}{s_h^2}$$

Képletek az **D** anyagrész feladatainak megoldásához

$$P_k = \frac{\lambda^k}{k!} e^{-\lambda}$$

$$\mu = \sigma^2 = \lambda$$

$$P_k = \binom{n}{k} p^k (1-p)^{n-k}$$

$$\mu = np \qquad \sigma = \sqrt{np(1-p)}$$

$$\binom{n}{k} = \frac{n!}{k!\,(n-k)!}$$

$$P_k = \frac{\binom{M}{k}\binom{N-M}{n-k}}{\binom{N}{n}}$$

$$p = \frac{(a+b)!\,(c+d)!\,(a+c)!\,(b+d)!}{N!\ a!\ b!\ c!\ d!}$$

$$\chi^2 = \sum_{j=1}^{k} \frac{(n_j - \nu_j)^2}{\nu_j}$$

$$\chi^2 = \frac{N(ad-bc)^2}{(a+b)(c+d)(a+c)(b+d)}$$

$$\chi^2 = \frac{(c-b)^2}{(c+b)}$$

$$\chi^2 = \frac{N(|ad-bc| - \frac{N}{2})^2}{(a+b)(c+d)(a+c)(b+d)}$$

$$\chi^2 = \frac{(|c-b|-1)^2}{c+b}$$

$$\varphi = \frac{ad-bc}{\sqrt{(a+b)(c+d)(a+c)(b+d)}}$$

$$\psi = \frac{ad-bc}{ad+bc}$$

$$N\varphi^2 = \chi^2$$

$$\chi^2 = \sum\sum \frac{(n_{ij} - \nu_{ij})^2}{\nu_{ij}}$$

$$\nu_{ij} = \frac{n_{i\cdot} n_{\cdot j}}{N}$$

$$\chi^2 = N\left(\sum\sum \frac{n_{ij}^2}{n_{i\cdot} n_{\cdot j}} - 1\right)$$

$$\Psi = \frac{E-F}{E+F}$$

$$\Phi = \sqrt{\frac{\chi^2}{N(\min(g,h)-1)}}$$

Képletek a **V** anyagrész feladatainak megoldásához

$$Q_t = Q_k + Q_b$$

$$Q_t = Q_k + Q_s + Q_e$$

$$Q_t = Q_A + Q_B + Q_I + Q_b$$

$$Q_t = Q_r + Q_g + Q_b$$

$$Q_t = Q_A + Q_B + Q_C + Q_{AB} + Q_{AC} + Q_{BC} + Q_{ABC} + Q_b$$

$$Q_v = Q_g + Q_b$$

$$Q_b = \sum Q_j$$

$$Q_k = \sum n_j (\bar{x}_j - \bar{\bar{x}})^2$$

$$Q_b = \sum \sum x_{ij}^2 - \sum \frac{T_j^2}{n_j}$$

$$Q_k = \sum \frac{T_j^2}{n_j} - \frac{\left(\sum \sum x_{ij} \right)^2}{N}$$

$$Q_g = \sum_j n_j (\bar{y}_j - Y_j)^2$$

$$Q_r = \sum_j n_j (Y_j - \bar{\bar{y}})^2$$

$$Q_g = Q_y (e^2 - r^2)$$

$$Q_r = \frac{\left(\sum x_j T_j - (\sum n_j x_j)(\sum T_j)/N \right)^2}{\sum n_j x_j^2 - (\sum n_j x_j)^2 / N}$$

$$Q_s = \sum_i h(\bar{x}_i' - \bar{\bar{x}})^2$$

$$Q_e = \sum \sum (x_{ij} - \bar{x}_i' - \bar{x}_j + \bar{\bar{x}})^2$$

$$Q_s = \sum_i \frac{T_i'^2}{h} - \frac{\left(\sum \sum x_{ij} \right)^2}{N}$$

$$Q_e = \sum \sum x_{ij}^2 - \sum_i \frac{T_i'^2}{h} - \sum_j \frac{T_j^2}{g} + \frac{\left(\sum \sum x_{ij} \right)^2}{N}$$

$$L = \sum c_j \bar{x}_j \quad \left(\sum c_j = 0 \right)$$

$$L - K s_L \le \Lambda \le L + K s_L$$

$$s_L^2 = s_b^2 \sum \frac{c_j^2}{n_j}$$

$$K^2 = (h-1) F_p$$

$$e = \sqrt{\frac{Q_k}{Q_t}}$$

$$F = \frac{s_k^2}{s_b^2}$$

$$F = \frac{s_k^2}{s_e^2}$$

$$F = \frac{s_g^2}{s_b^2}$$

$$F = \frac{s_r^2}{s_v^2}$$

$$F = \frac{s_s^2}{s_e^2}$$

$$B = f_b \ln s_b^2 - \sum f_j \ln s_j^2$$

$$C = 1 + \frac{\sum \frac{1}{f_j} - \frac{1}{f_b}}{3(h-1)}$$

Képletek az **R** anyagrész feladatainak megoldásához

$$\mu_j = \frac{n_j (N+1)}{2}$$

$$\sigma_R^2 = \frac{n_1 n_2 (N+1)}{12}$$

$$E_i = e_i^3 - e_i$$

$$\sigma_R^2 = \frac{n_1 n_2 (N^3 - N - \sum E_i)}{12N(N-1)}$$

$$\mu_+ = \frac{n(n+1)}{4}$$

$$\sigma_+^2 = \frac{n(n+1)(2n+1)}{24}$$

$$H = \frac{12}{N(N+1)} \sum_j \frac{R_j^2}{n_j} - 3(N+1)$$

$$H_E = \frac{H}{1 - \frac{\sum E_i}{N^3 - N}}$$

$$G = \frac{12}{gh(h+1)} \sum_j R_j^2 - 3g(h+1)$$

$$\tau = \frac{E-F}{E+F}$$

$$r_S = 1 - \frac{6 \sum d_i^2}{n^3 - n}$$

$$\tau = 1 - \frac{4F}{n(n-1)}$$

$$\sigma_\tau^2 = \frac{2(2n+5)}{9n(n-1)}$$

$$W = \frac{12 Q_R}{h^2 (n^3 - n)}$$

$$h(n-1)W = \chi^2$$