1 Finding function form

1.1 Mean values of x

$$x_n = x_{10} = 10.000$$
$$x_{arif} = \frac{x_1 + x_n}{2} = \frac{1.000 + 10.000}{2} = 5.500$$
$$x_{geom} = \sqrt{x_1 * x_n} = \sqrt{1.000 * 10.000} = 3.162$$
$$x_{garm} = \frac{2 * x_1 * x_n}{x_1 + x_n} = \frac{2 * 1.000 * 10.000}{1.000 + 10.000} = 1.818$$

1.2 Interpolated y values for mean values of x

$$y_1^* = f(x_{arif}) = f(5.500) = 6.102$$
$$y_2^* = f(x_{geom}) = f(3.162) = 4.436$$
$$y_3^* = f(x_{garm}) = f(1.818) = 2.701$$

1.3 Mean values of y

$$y_n = y_{10} = 7.908$$
$$y_{arif} = \frac{y_1 + y_n}{2} = \frac{1.000 + 7.908}{2} = 4.454$$
$$y_{geom} = \sqrt{y_1 * y_n} = \sqrt{1.000 * 7.908} = 2.812$$
$$y_{garm} = \frac{2 * y_1 * y_n}{y_1 + y_n} = \frac{2 * 1.000 * 7.908}{1.000 + 7.908} = 1.775$$

1.4 Choosing function form according to epsilon error

$$\varepsilon_1 = |y_1^* - y_{arif}| = |6.102 - 4.454| = 1.648$$
$$\varepsilon_2 = |y_1^* - y_{geom}| = |6.102 - 2.812| = 3.290$$
$$\varepsilon_3 = |y_1^* - y_{garm}| = |6.102 - 1.775| = 4.326$$
$$\varepsilon_4 = |y_2^* - y_{arif}| = |4.436 - 4.454| = 0.018$$
$$\varepsilon_5 = |y_2^* - y_{geom}| = |4.436 - 2.812| = 1.624$$
$$\varepsilon_6 = |y_3^* - y_{arif}| = |2.701 - 4.454| = 1.753$$
$$\varepsilon_7 = |y_3^* - y_{garm}| = |2.701 - 1.775| = 0.926$$
$$\Rightarrow$$
$$\varepsilon_{min} = \varepsilon_4 = 0.018$$
$$\Rightarrow$$
$$y \approx a + b * log(x)$$

2 Fitting arguments

2.1 Transformation of coordinates from xOy to qOz

$$q = phi(x) = log(x)$$
$$z = psi(y) = y$$
$$A = a$$
$$B = b$$
$$z = A + Bq$$

2.2 Fitting arguments for linear function in qOz

$$B = \frac{n * \sum\limits_{i=1}^{n} q_i * z_i - \sum\limits_{i=1}^{n} q_i * \sum\limits_{i=1}^{n} z_i}{n * \sum\limits_{i=1}^{n} q_i^2 - (\sum\limits_{i=1}^{n} q_i)^2} = \frac{10 * 98.055 - 15.104 * 55.313}{10 * 27.650 - 228.143} = 3.000$$

$$A = \frac{\sum\limits_{i=1}^{n} z_i - B * \sum\limits_{i=1}^{n} q_i}{n} = \frac{55.313 - 3.000 * 15.104}{10} = 1.000$$