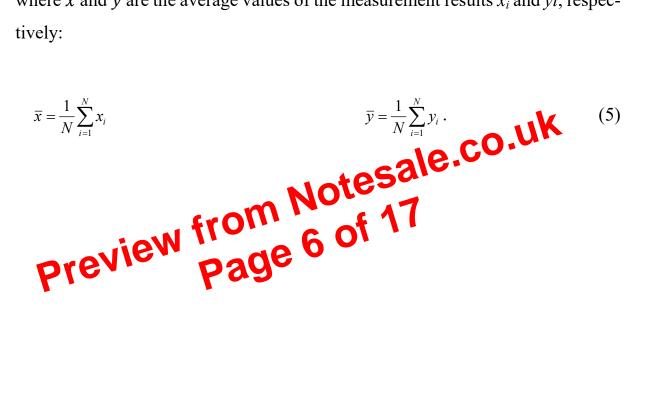
The best approximate value of the correlation coefficient that can be calculated using the measurement results is the value R, expressed by the following formula:

$$R = \frac{\sum_{i=1}^{N} [(x_i - \bar{x})(y_i - \bar{y})]}{\sqrt{\sum_{i=1}^{N} (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^{N} (y_i - \bar{y})^2}},$$
(4)

where \bar{x} and \bar{y} are the average values of the measurement results x_i and y_i , respectively:



The first step is to determine the number ε , which is the root of the following nonlinear equation

$$\alpha = 2 \cdot \Phi(\varepsilon) , \qquad (7)$$

(9)

where $\Phi(x)$ is the Laplace function

when Ve

efficient *R* as follows:

$$\Phi(x) = \frac{1}{\sqrt{2\pi}} \int_{0}^{x} \exp\left(-\frac{t^2}{2}\right) dt \quad . \tag{8}$$

In practice, equation (7) is solved using a table of values of the Laplace function. According to the given value of the Laplace function $\alpha/2$, the corresponding value of the argument ε is extracted from the table. (If there is no numeric value $\alpha/2$ in the table, linear interpolation should be applied.)

The confidence interval for the correlation coefficient p_{XY} is represented as: $th(U - \varepsilon/\sqrt{(1 + \varepsilon)}) \le p_{XY} \le th(U + \varepsilon/\sqrt{(N - 3)}),$ lue that is relaten to the arr lows:



the approximate value of the correlation co-

The function th(z) is a hyperbolic tangent that can be expressed in terms of the exponential function of the doubled argument:

$$th(x) = \frac{\exp(2x) - 1}{\exp(2x) + 1}.$$
(11)