

Question #16662 What is Rate of change?

Solution. There are a few possible meanings. First one is the following, consider some function $y = y(x)$, we are to characterize the speed of change of values of y in some neighborhood of x_0 , so we are to look at quotient $\frac{y(x_0 + \delta) - y(x_0)}{\delta}$, if δ passes to 0, that is $x_0 + \delta$ is close to x_0 and the limits $\lim_{\delta \rightarrow 0} \frac{y(x_0 + \delta) - y(x_0)}{\delta}$ exists, then it is known as derivative of y or the rate of change. The other possible meaning is if we are to look at discrete time process x_n , then by the rate of change we mean $\frac{x_n - x_{n-1}}{x_{n-1}}$ or $\frac{x_n - x_{n-k}}{x_{n-k}}$ for some $k < n$.