# Gradient and backpropagation

## Gradient

### Derivation function approximation

The definition of derivation is

With is Infinitely small value. If we substitute it as a “small value”, it would not cause a big offset. We get the following equation

e.g. If we want the get the approximation of when x is close to 0, use the above equation we get

Then we replace with 0, , we get when x is close to 0.

### Gradient

### Lagrange multiplier (Lagrangian function).

<https://www.zhihu.com/question/38586401>

https://en.wikipedia.org/wiki/Lagrange\_multiplier

The method can be summarized as follows: in order to find the maximum or minimum of a function subject to the equality constraint , form the Lagrangian function

And find the stationary points of considered as a function of and the Lagrange multiplier