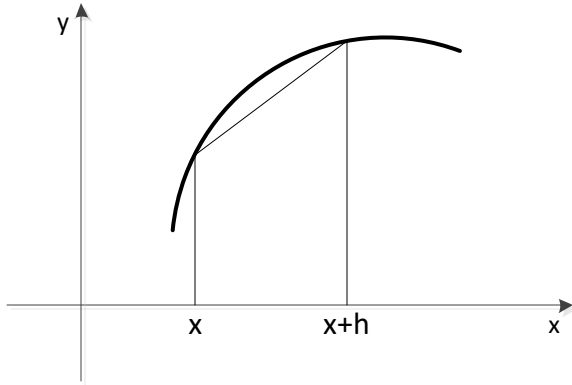


### Forward Difference

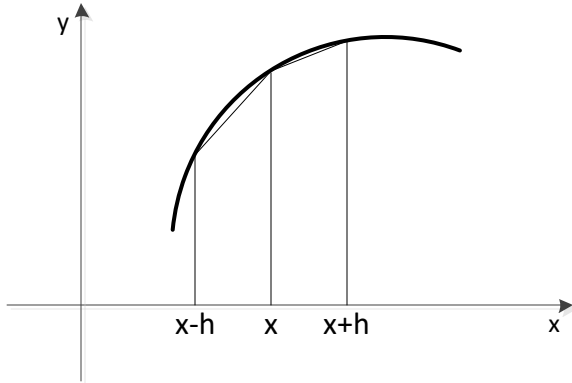


$$f(x+h) = f(x) + hf'(x) + \frac{h^2}{2}f''(x) + \frac{h^3}{6}f'''(x) + \dots$$

$$f'(x) = \frac{f(x+h) - f(x)}{h} - \frac{h}{2}f''(x) - \frac{h^2}{6}f'''(x) + \dots$$

$$f'(x) = \frac{f(x+h) - f(x)}{h} + O(h)$$

### Central Difference



$$f(x-h) = f(x) - hf'(x) + \frac{h^2}{2}f''(x) - \frac{h^3}{6}f'''(x) + \dots$$

$$f'(x) = \frac{f(x) - f(x-h)}{h} + O(h)$$

$$f(x+h) - f(x-h) = 2hf'(x) + \frac{1}{3}h^3f'''(x) + \dots$$

$$f'(x) = \frac{f(x+h) - f(x-h)}{2h} + O(h^2)$$