An alternative Form For Taylor Series.

If f is analytic we know that we can write

$$f(x) = f(a) + f'(a)(x-a) + \frac{f''(a)}{2!}(x-a)^2 + \frac{f'''(a)}{3!}(x-a)^3 + \cdots$$

Now we can also write

$$f(x+h) = f(x) + f'(x)h + \frac{f''(x)}{2!}h^2 + \frac{1}{3!}f'''(x)h^3 + \text{etc}$$

This is quite a useful form

For example if h is small, then we have expressions like

$$f(x+h) \approx f(x) + f'(x)h + \frac{1}{2}f''(x)h^2.$$

This form will be useful for Q5 on the 2023 assignment.