

Calculating Differentials

Tangent line approximation.

$$f(x + \Delta x) = f(x) + \Delta y = f(x) + f'(x) \Delta x$$

$$dy = f'(x) dx \text{ so } \Delta y = f'(x) \Delta x$$

$$\text{Relative Error} = \frac{\Delta f}{f} \text{ in \%}$$

$$\text{Example: } \sqrt[4]{82} \rightarrow f(x) = \sqrt[4]{x}, f(x + \Delta x) = f(81 + 1)$$