Summary: Linear approximation

Linear approximation

The linear approximation for a function f near a point $x = a$ is given by the following equivalent formulas:

$$\Delta f \approx \left.\frac{df}{dx}\right|_{x=a} \cdot \Delta x \qquad \text{for } \Delta x \text{ near } 0$$

$$f(x) \approx f'(a)(x-a) + f(a) \quad \text{for } x \text{ near } a$$