$f(x) := \sqrt{x}$ $x := 1$ $dx := 3$ $diff(x) := \frac{d}{dx} f(x)$ $ddiff(x) := \frac{d^2}{dx^2} f(x)$

a $f(x) = 1$ $f(x + dx) = 2$

b $f(x) + dx \cdot diff(x) \rightarrow \frac{5}{2} = 2.5$ $f(x + dx) - (f(x) + dx \cdot diff(x)) \rightarrow 4^{\frac{1}{2}} - \frac{5}{2} = -0.5$

c $f(x) + dx \cdot diff(x + dx) \rightarrow 1 + \frac{3}{8} \cdot 4^{\frac{1}{2}} = 1.75$ $f(x + dx) - (f(x) + dx \cdot diff(x + dx)) \rightarrow \frac{5}{8} \cdot 4^{\frac{1}{2}} - 1 = 0.25$

d $f(x) + \frac{dx \cdot diff(x) + dx \cdot diff(x + dx)}{2} \rightarrow \frac{7}{4} + \frac{3}{16} \cdot 4^{\frac{1}{2}} = 2.125$

$f(x + dx) - \left(f(x) + \frac{dx \cdot diff(x) + dx \cdot diff(x + dx)}{2} \right) \rightarrow \frac{13}{16} \cdot 4^{\frac{1}{2}} - \frac{7}{4} = -0.125$

e $f(x) + dx \cdot diff(x) + \frac{dx^2 \cdot ddiff(x)}{2} \rightarrow \frac{11}{8} = 1.375$

$f(x + dx) - \left(f(x) + dx \cdot diff(x) + \frac{dx^2 \cdot ddiff(x)}{2} \right) \rightarrow 4^{\frac{1}{2}} - \frac{11}{8} = 0.625$

$f(x) := \sqrt{x}$ $x := 16$ $dx := 9$ $diff(x) := \frac{d}{dx} f(x)$ $ddiff(x) := \frac{d^2}{dx^2} f(x)$

a $f(x) = 4$ $f(x + dx) = 5$

b $f(x) + dx \cdot diff(x) \rightarrow \frac{41}{32} \cdot 16^{\frac{1}{2}} = 5.125$ $-f(x + dx) + (f(x) + dx \cdot diff(x)) \rightarrow -25^{\frac{1}{2}} + \frac{41}{32} \cdot 16^{\frac{1}{2}} = 0.125$

c $f(x) + dx \cdot diff(x + dx) \rightarrow 16^{\frac{1}{2}} + \frac{9}{50} \cdot 25^{\frac{1}{2}} = 4.9$ $-f(x + dx) + (f(x) + dx \cdot diff(x + dx)) \rightarrow \frac{-41}{50} \cdot 25^{\frac{1}{2}} + 16^{\frac{1}{2}} = -0.1$

d $f(x) + \frac{dx \cdot diff(x) + dx \cdot diff(x + dx)}{2} \rightarrow \frac{73}{64} \cdot 16^{\frac{1}{2}} + \frac{9}{100} \cdot 25^{\frac{1}{2}} = 5.0125$

$-f(x + dx) + \left(f(x) + \frac{dx \cdot diff(x) + dx \cdot diff(x + dx)}{2} \right) \rightarrow \frac{-91}{100} \cdot 25^{\frac{1}{2}} + \frac{73}{64} \cdot 16^{\frac{1}{2}} = 0.0125$

e $f(x) + dx \cdot diff(x) + \frac{dx^2 \cdot ddiff(x)}{2} \rightarrow \frac{2543}{2048} \cdot 16^{\frac{1}{2}} = 4.9667969$

$$-f(x + dx) + \left(f(x) + dx \cdot diff(x) + \frac{dx^2 \cdot ddiff(x)}{2}\right) \rightarrow -25^{\frac{1}{2}} + \frac{2543}{2048} \cdot 16^{\frac{1}{2}} = -0.0332031$$

$f(x) := \cos(x) \qquad x := 0 \qquad dx := \frac{\pi}{6} \qquad diff(x) := \frac{d}{dx} f(x) \qquad ddiff(x) := \frac{d^2}{dx^2} f(x)$

a $f(x) = 1$

$f(x + dx) = 0.8660254$

b $f(x) + dx \cdot diff(x) \rightarrow 1 = 1$

$-f(x + dx) + (f(x) + dx \cdot diff(x)) \rightarrow \frac{-1}{2} \cdot 3^{\frac{1}{2}} + 1 = 0.1339746$

c $f(x) + dx \cdot diff(x + dx) \rightarrow 1 - \frac{1}{12} \cdot \pi = 0.7382006$

$-f(x + dx) + (f(x) + dx \cdot diff(x + dx)) \rightarrow \frac{-1}{2} \cdot 3^{\frac{1}{2}} + 1 - \frac{1}{12} \cdot \pi = -0.1278248$

d $f(x) + \frac{dx \cdot diff(x) + dx \cdot diff(x + dx)}{2} \rightarrow 1 - \frac{1}{24} \cdot \pi = 0.8691003$

$$-f(x + dx) + \left(f(x) + \frac{dx \cdot diff(x) + dx \cdot diff(x + dx)}{2}\right) \rightarrow \frac{-1}{2} \cdot 3^{\frac{1}{2}} + 1 - \frac{1}{24} \cdot \pi = 0.0030749$$

e $f(x) + dx \cdot diff(x) + \frac{dx^2 \cdot ddiff(x)}{2} \rightarrow 1 - \frac{1}{72} \cdot \pi^2 = 0.8629222$

$$-f(x + dx) + \left(f(x) + dx \cdot diff(x) + \frac{dx^2 \cdot ddiff(x)}{2}\right) \rightarrow \frac{-1}{2} \cdot 3^{\frac{1}{2}} + 1 - \frac{1}{72} \cdot \pi^2 = -0.0031032$$