Approximation of Derivatives

This is an ungraded tool to develop your understanding of the material.

Here you can compare how much the approximation of derivative $\frac{\Delta f}{\Delta x}$ differs from the exact derivative $\frac{df}{dx}$, depending on the size of Δx. Dragging the black dot on the top graph you can change the value of Δx - to control the length of the interval on which the approximation is calculated. Dragging the orange or blue dots you will move around the location of the triangle showing Δf and Δx.

On the bottom graph, you can compare two lines corresponding to the exact derivative and its approximation.

$\Delta x = 2$

$\Delta f = 16.00$

Δx

Δf

$\frac{df}{dx}$

$\frac{\Delta f}{\Delta x}$

$\frac{df}{dx}$

$\frac{df}{dx} = 2.50$

$\frac{\Delta f}{\Delta x} = 8.00$

— exact derivative

— approximation of the derivative