Session 2

Fakhir

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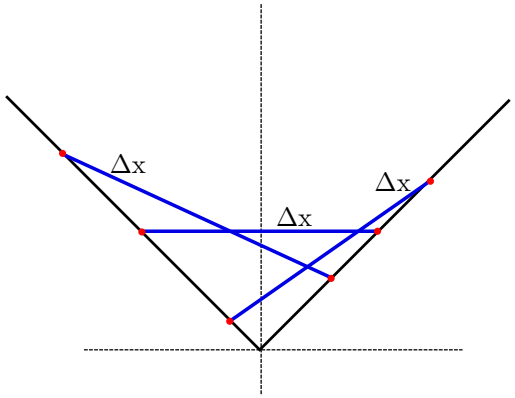
Solutions

Break the function into two pieces, namely for $x > 0$ and $x < 0$.

$$f'(x) = \begin{cases} 1, & \text{if } x > 0 \\ -1, & \text{if } x < 0 \\ undefined, & \text{if } x = 0 \end{cases}$$

The reason it is undefined at $x = 0$ is because Δx can have one end on one piece of the function and the other end on different piece of the function. This implies that even if Δx has same magnitude in different cases but its slope can drastically vary depending on how we choose the end points, as shown in the following figure:



The above explanation may not be correct.

The arguments given in the MiT's solution appear to be much more convincing.