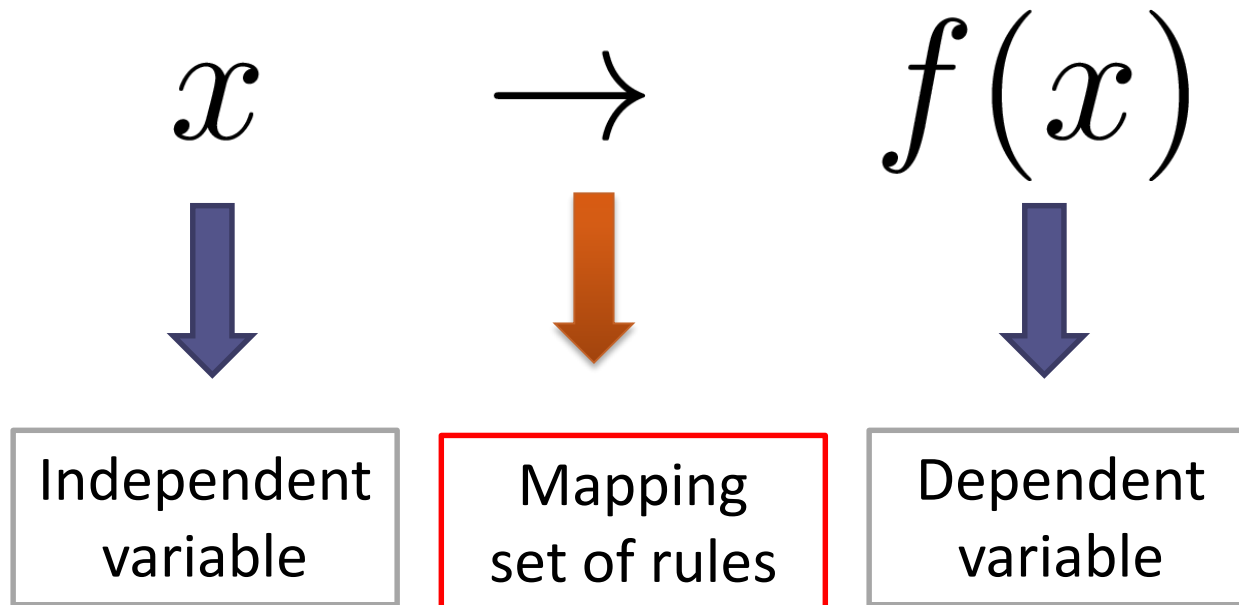
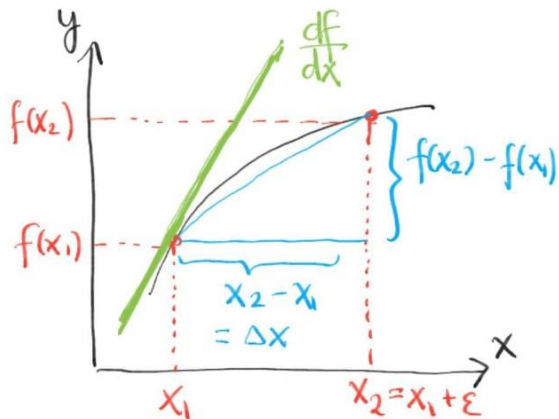


Pembahasan Tes Diagnostik



$$\{x, y, \dots\} \rightarrow f(x, y, \dots)$$

TURUNAN/DIFFERENSIAL



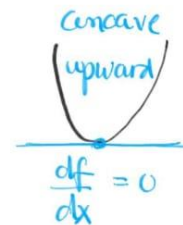
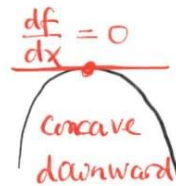
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

$$= \frac{f(x_1 + \epsilon) - f(x_1)}{\epsilon}$$

$$\frac{df}{dx} = \lim_{\epsilon \rightarrow 0} \frac{f(x_1 + \epsilon) - f(x_1)}{\epsilon}$$

- $\frac{df}{dx} \rightarrow$ gradient garis pada sebuah titik di kurva $f(x)$

- $\frac{df}{dx} = 0 \rightarrow$ titik ekstrim
 - max
 - min

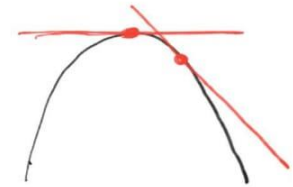


- max $\rightarrow \frac{d}{dx} \left(\frac{df}{dx} \right) < 0$

- min $\rightarrow \frac{d}{dx} \left(\frac{df}{dx} \right) > 0$

- inflection $\rightarrow \frac{d}{dx} \left(\frac{df}{dx} \right) = 0$

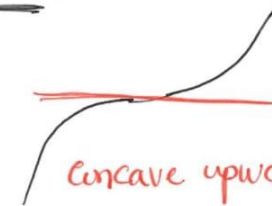
Max



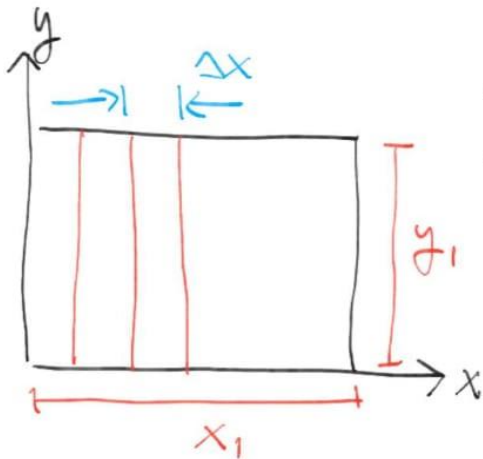
- $\frac{d}{dx} \left(\frac{df}{dx} \right) \rightarrow$ rate of change of the slope / gradient

- $\frac{d}{dx} \left(\frac{df}{dx} \right) < 0 \rightarrow$ max

Inflection



\leftrightarrow concave downward



- Area = $x_1 \cdot y_1$
- Divide rectangle into N bins
- $\Delta x = \frac{x_1}{N}$
- Area of 1 bin : $\frac{x_1}{N} \cdot y_1$

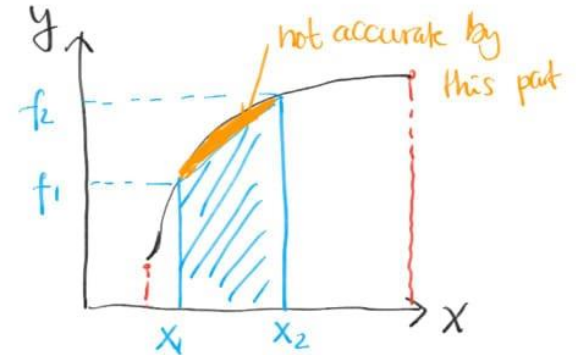
$$A = \sum_{i=1}^N \Delta x_i \cdot y_i$$

$$= N(\Delta x \cdot y_1)$$

$$= N \cdot \frac{x_1}{N} \cdot y_1 = x_1 y_1$$

- There are N bins

$$\Rightarrow \text{total area} : N \left(\frac{x_1}{N} \cdot y_1 \right) = x_1 \cdot y_1$$



- shaded region

$$\frac{f_1 + f_2}{2} \cdot \underbrace{(x_2 - x_1)}_{\Delta x}$$

- error becomes small as $x_2 \rightarrow x_1$ or $\Delta x \rightarrow 0$
- As $x_2 \rightarrow x_1 \Rightarrow \frac{f_1 + f_2}{2} \approx f_1$

$$\text{Area} = \lim_{\Delta x \rightarrow 0} \sum_i \Delta x_i \cdot f_i$$

$$= \int f(x) dx$$