De kettingregel

Dat is wel een soort toppunt…☺

De kettingregel

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

$$h(x) = (3x - 2)^2$$

Neem $f(x) = x^2$ en $g(x) = 3x - 2$

Dan is $h(x) = f(g(x))$

$$x \xrightarrow{g(x)} 3x - 2 \xrightarrow{f(x)} (3x - 2)^2$$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

Neem $f(x) = x^2$ en $g(x) = 3x - 2$

$$x \xrightarrow{g(x)} 3x - 2 \xrightarrow{f(x)} (3x-2)^2$$

$$f'(x) = 2x$$

$$g'(x) = 3$$

Dus $[f(g(x))]' = 2(3x-2) \cdot 3$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

De afgeleide van $h(x) = (3x - 2)^2$:

$$h'(x) = 2(3x - 2) \cdot 3$$

$$h'(x) = 6(3x - 2)$$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

$$h(x) = \left(1 - x^3\right)^6$$

$$f(x) = (\ldots)^6 \text{ en } g(x) = 1 - x^3$$

$$h'(x) = 6\left(1 - x^3\right)^5 \cdot -3x^2$$

$$h'(x) = -18x^2\left(1 - x^3\right)^5$$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

$$h(x) = \sqrt{x^2 - 4x}$$

$$f(x) = \sqrt{\dots} \rightarrow f'(x) = \frac{1}{2\sqrt{\dots}}$$

$$g(x) = x^2 - 4x \rightarrow g'(x) = 2x - 4$$

$$h'(x) = \frac{1}{2\sqrt{x^2 - 4x}} \cdot (2x - 4)$$

$$h'(x) = \frac{2x - 4}{2\sqrt{x^2 - 4x}}$$

$$h'(x) = \frac{x - 2}{\sqrt{x^2 - 4x}}$$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

$$h(x) = \left(1 - x^{10}\right)^{10}$$

$$f(x) = (...)^{10} \rightarrow f'(x) = 10\,(...)^{9}$$

$$g(x) = 1 - x^{10} \rightarrow g'(x) = -10x^{9}$$

$$h'(x) = 10\left(1 - x^{10}\right)^{9} \cdot -10x^{9}$$

$$h'(x) = -100x^{9} \cdot \left(1 - x^{10}\right)^{9}$$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

$$h(x) = \sqrt{x^3 - 2x^2 + 2x - 1}$$

$$f(x) = \sqrt{\ldots} \to f'(x) = \frac{1}{2\sqrt{\ldots}}$$

$$g(x) = x^3 - 2x^2 + 2x - 1 \to g'(x) = 3x^2 - 4x + 2$$

$$h'(x) = \frac{1}{2\sqrt{x^3 - 2x^2 + 2x - 1}} \cdot (3x^2 - 4x + 2)$$

$$h'(x) = \frac{3x^2 - 4x + 2}{2\sqrt{x^3 - 2x^2 + 2x - 1}}$$

Einde

3 studietips:

Oefenen, oefenen en oefenen!