

Speeddaten differentiëren (opgaven)

Opgave	Functie	Functie herschreven, klaar om te differentiëren	Afgeleide functie + herleiding
1	$f(x) = \frac{6}{x^3} + 6x^3$		
2	$g(x) = 3x^6 - \frac{4}{x}$		
3	$m(t) = 12t \cdot \sqrt[4]{t}$		
4	$l(p) = \frac{2}{p} + \frac{1}{2p^2}$		
5	$h(x) = 3x\sqrt{x} - 2\sqrt{x}$		
6	$k(q) = \frac{1}{q}$		

7	$y = x + \frac{4}{\sqrt{x}}$		
8	$y = 3x^2\sqrt{x}$		
9	$y = 3x - x^{-1,65}$		
10	$y = 10x^{1,72} + \frac{6}{x^{1,35}}$		
11	$y = \frac{2}{5x} + \frac{5x}{2}$		
12	$y = (1 + x)\sqrt{x}$		

Speeddaten differentiëren (uitwerkingen)

Opgave	Functie	Functie herschreven, klaar om te differentiëren	Afgeleide functie + herleiding
1	$f(x) = \frac{6}{x^3} + 6x^3$	$= 6x^{-3} + 6x^3$	$f'(x) = -18x^{-4} + 18x^2 = -\frac{18}{x^4} + 18x^2$
2	$g(x) = 3x^6 - \frac{4}{x}$	$= 3x^6 - 4x^{-1}$	$g'(x) = 18x^5 + 4x^{-2} = 18x^5 + \frac{4}{x^2}$
3	$m(t) = 12t \cdot \sqrt[4]{t}$	$= 12t \cdot t^{\frac{1}{4}} = 12t^{1\frac{1}{4}}$	$m'(t) = 15t^{\frac{1}{4}} = 15\sqrt[4]{t}$
4	$l(p) = \frac{2}{p} + \frac{1}{2p^2}$	$= 2p^{-1} + \frac{1}{2} \cdot \frac{1}{p^2} = 2p^{-1} + \frac{1}{2}p^{-2}$	$l'(p) = -2p^{-2} - p^{-3} = -\frac{2}{p^2} - \frac{1}{p^3}$
5	$h(x) = 3x\sqrt{x} - 2\sqrt{x}$	$= 3x^{1\frac{1}{2}} - 2x^{\frac{1}{2}}$	$h'(x) = 4\frac{1}{2} \cdot x^{\frac{1}{2}} - x^{-\frac{1}{2}} = 4\frac{1}{2}\sqrt{x} - \frac{1}{\sqrt{x}}$
6	$k(q) = \frac{1}{q}$	$= q^{-1}$	$k'(q) = -q^{-2} = -\frac{1}{q^2}$

7	$y = x + \frac{4}{\sqrt{x}}$	$= x + 4 \cdot \frac{1}{\sqrt{x}} = x + 4x^{-\frac{1}{2}}$	$\frac{dy}{dx} = 1 - 2x^{-\frac{1}{2}} = 1 - 2 \cdot \frac{1}{x^{\frac{1}{2}}} = 1 - \frac{2}{x\sqrt{x}}$
8	$y = 3x^2\sqrt{x}$	$= 3x^2 \cdot x^{\frac{1}{2}} = 3x^{2\frac{1}{2}}$	$\frac{dy}{dx} = 7\frac{1}{2}x^{1\frac{1}{2}} = 7\frac{1}{2}x\sqrt{x}$
9	$y = 3x - x^{-1,65}$		$\frac{dy}{dx} = 3 + 1,65x^{0,65}$
10	$y = 10x^{1,72} + \frac{6}{x^{1,35}}$	$= 10x^{1,72} + 6 \cdot \frac{1}{x^{1,35}} = 10x^{1,72} + 6x^{-1,35}$	$\frac{dy}{dx} = 1,72x^{0,72} - 8,1x^{-2,35} = 1,72x^{0,72} - \frac{8,1}{x^{2,35}}$
11	$y = \frac{2}{5x} + \frac{5x}{2}$	$= \frac{2}{5} \cdot \frac{1}{x} + \frac{5}{2}x = \frac{2}{5}x^{-1} + \frac{5}{2}x$	$\frac{dy}{dx} = -\frac{2}{5}x^{-2} + \frac{5}{2} = -\frac{2}{5x^2} + 2\frac{1}{2}$
12	$y = (1+x)\sqrt{x}$	$y = \sqrt{x} + x\sqrt{x} = x^{\frac{1}{2}} + x^{1\frac{1}{2}}$	$\frac{dy}{dx} = \frac{1}{2}x^{-\frac{1}{2}} + 1\frac{1}{2}x^{\frac{1}{2}} = \frac{1}{2\sqrt{x}} + 1\frac{1}{2}\sqrt{x}$