Newtonverfahren zur Bestimmung von Nullstellen

$f(x) = -3x^5 - 2x^3 - 3x - 2$

Startwert: 5

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	5			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

$f(x) = -2x^5 - 2x^4 - 1x^3 - 3x^2 - 3x + 3$

Startwert: 2

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	2			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Lösung

$f'(x) = -15x^4 - 6x^2 - 3$

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	5,000	-9642,00000	-9528,00000	3,98804
1	3,98804	-3167,14838	-3892,68770	3,17442
2	3,17442	-1042,53809	-1586,63404	2,51735
3	2,51735	-344,73091	-643,39072	1,98154
4	1,98154	-115,15674	-257,82099	1,53489
5	1,53489	-39,39338	-100,38790	1,14248
6	1,14248	-14,24912	-36,38676	0,75087
7	0,75087	-5,81540	-11,15114	0,22937
8	0,22937	-2,71414	-3,35717	-0,57909
9	-0,57909	0,32105	-6,69897	-0,53117
10	-0,53117	0,02008	-5,88688	-0,52776

$f'(x) = -10x^4 - 8x^3 - 3x^2 - 6x - 3$

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	2,000	-119,00000	-251,00000	1,52590
1	1,52590	-39,50269	-101,77574	1,13776
2	1,13776	-12,93427	-42,25011	0,83163
3	0,83163	-3,89702	-19,44892	0,63125
4	0,63125	-0,85880	-11,58319	0,55711
5	0,55711	-0,07537	-9,62043	0,54928
6	0,54928	-0,00072	-9,43681	0,54920
7	0,54920	0,00000	-9,43504	0,54920
8	0,54920	0,00000	-9,43504	0,54920
9	0,54920	0,00000	-9,43504	0,54920
10	0,54920	0,00000	-9,43504	0,54920

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