Newtonverfahren zur Bestimmung von Nullstellen

Lösung

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

Startwert: 4

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

f'(x) = - 15x^4 - 2

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	4,000	-3077,00000	-3842,00000	3,19912
1	3,19912	-1008,64004	-1573,12483	2,55795
2	2,55795	-330,64777	-644,17925	2,04466
3	2,04466	-108,29720	-264,16555	1,63470
4	1,63470	-35,28907	-109,11342	1,31128
5	1,31128	-11,25324	-46,34843	1,06849
6	1,06849	-3,31497	-21,55099	0,91467
7	0,91467	-0,74994	-12,49891	0,85467
8	0,85467	-0,07740	-10,00349	0,84693
9	0,84693	-0,00111	-9,71759	0,84682
10	0,84682	0,00000	-9,71342	0,84682

f(x) = -3x^5 - 3x³ - 2x² - 3x + 6

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				

f'(x) = - 15x^4 - 9x² - 4x - 3

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	2,000	-128,00000	-287,00000	1,55401
1	1,55401	-41,93894	-118,42933	1,19988
2	1,19988	-13,12277	-51,84858	0,94678
3	0,94678	-3,46152	-26,90763	0,81814
4	0,81814	-0,53562	-19,01714	0,78997
5	0,78997	-0,01995	-17,61811	0,78884
6	0,78884	-0,00003	-17,56406	0,78884
7	0,78884	0,00000	-17,56397	0,78884
8	0,78884	0,00000	-17,56397	0,78884
9	0,78884	0,00000	-17,56397	0,78884
10	0,78884	0,00000	-17,56397	0,78884

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