Newtonverfahren zur Bestimmung von Nullstellen

Lösung

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

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				

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

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	4,000	1258,00000	1527,00000	3,17616
1	3,17616	409,73510	629,65177	2,52543
2	2,52543	132,49807	261,75713	2,01924
3	2,01924	42,09743	111,01759	1,64005
4	1,64005	12,77032	49,53902	1,38226
5	1,38226	3,40375	25,05252	1,24640
6	1,24640	0,62153	16,31933	1,20831
7	1,20831	0,03904	14,29832	1,20558
8	1,20558	0,00019	14,16005	1,20557
9	1,20557	0,00000	14,15937	1,20557
10	1,20557	0,00000	14,15937	1,20557

$f(x) = -2x^5 - 1x^3 - 2x - 6$

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				

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

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	2,000	-82,00000	-174,00000	1,52874
1	1,52874	-29,32923	-63,62831	1,06779
2	1,06779	-12,12929	-18,42049	0,40932
3	0,40932	-6,91020	-2,78335	-2,07337
4	-2,07337	83,69351	-199,70058	-1,65428
5	-1,65428	26,61422	-85,10200	-1,34155
6	-1,34155	7,78832	-39,79014	-1,14581
7	-1,14581	1,74593	-23,17531	-1,07048
8	-1,07048	0,17897	-18,56904	-1,06084
9	-1,06084	0,00256	-18,04084	-1,06070
10	-1,06070	0,00000	-18,03317	-1,06070

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