Newtonverfahren zur Bestimmung von Nullstellen

Lösung

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

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				

$f'(x) = -5x^4 - 12x^3 - 9x^2 - 6x - 3$

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	2,000	-123,00000	-227,00000	1,45815
1	1,45815	-41,20810	-90,69218	1,00378
2	1,00378	-14,13275	-35,30320	0,60345
3	0,60345	-5,03991	-13,19812	0,22159
4	0,22159	-1,85247	-4,91403	-0,15539
5	-0,15539	-0,59667	-2,24287	-0,42142
6	-0,42142	-0,12533	-1,32943	-0,51569
7	-0,51569	-0,01501	-1,00720	-0,53059
8	-0,53059	-0,00040	-0,95396	-0,53101
9	-0,53101	0,00000	-0,95247	-0,53101
10	-0,53101	0,00000	-0,95247	-0,53101

$f(x) = 1x^5 - 2x^4 - 2x^3 + 1x - 6$

Startwert: 1

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

$f'(x) = 5x^4 - 8x^3 - 6x^2 + 1$

Schritt	xn	f(xn)	f'(xn)	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	1,000	-8,00000	-8,00000	0,00000
1	0,00000	-6,00000	1,00000	6,00000
2	6,00000	4752,00000	4537,00000	4,95261
3	4,95261	1532,40500	1890,19733	4,14190
4	4,14190	486,40373	801,15041	3,53477
5	3,53477	148,80383	353,28240	3,11356
6	3,11356	41,39792	171,25993	2,87184
7	2,87184	8,80412	102,13523	2,78564
8	2,78564	0,86037	82,58485	2,77522
9	2,77522	0,01148	80,38670	2,77508
10	2,77508	0,00000	80,35681	2,77508

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