

Exemplo 5 – Newton-Raphson

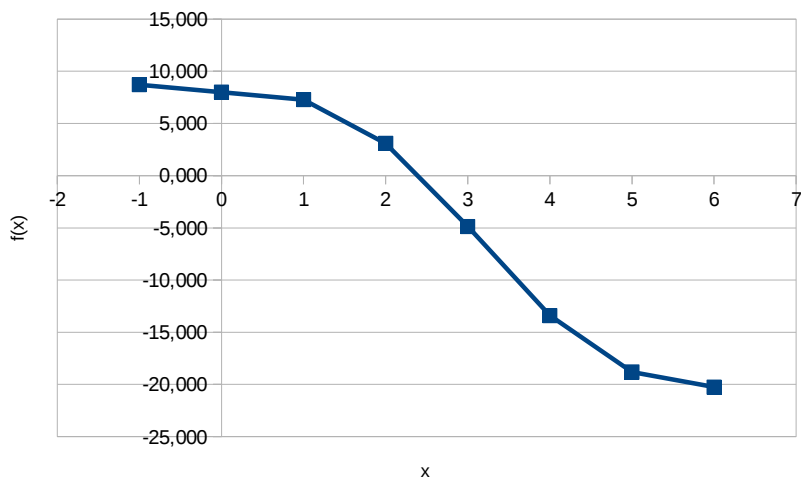
$$f(x) = 8 - 4,5(x - \sin x)$$

x	f(x)
-1	8,713
0	8,000
1	7,287
2	3,092
3	-4,865
4	-13,406
5	-18,815
6	-20,257

$$e = 0,001$$

$$f'(x) = -4,5(1 - \cos x)$$

$$f''(x) = -4,5 \sin(x)$$



b) Melhor extremo (valor inicial), onde $f(x) \cdot f''(x) > 0$

x	f(x)	f''(x)	f(x)*f''(x)
2	3,092	-4,0918	-12,6513
3	-4,865	-0,6350	3,089444

<--- Aqui

x_(i+1) - x_i						
N	x_(i)	f(x)	f'(x)	x_(i+1)	E_ideal	E
1	3	-4,865	-8,95497	2,456731	0,001	0,54327
2	2,4567	-0,209	-7,98528	2,430590	0,001	0,02614
3	2,4306	-0,001	-7,90969	2,430466	0,001	0,00012

FIM!

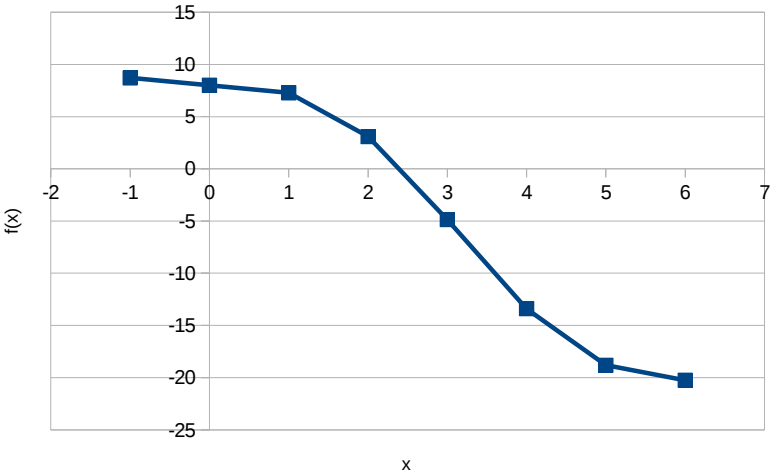
Solução: 2,430466

Exemplo 5 – Bisection

$f(x) = 8 - 4,5(x - \sin x)$

x	f(x)
-1	8,713
0	8,000
1	7,287
2	3,092
3	-4,865
4	-13,406
5	-18,815
6	-20,257
e	0,001

N de iterações 9,97



N	A	B	x_ns	f(x_ns)	f(A)	f(B)	f(A)*f(x_ns)	f(x_ns)*f(B)	E_ideal	E
1	2,000000	3,000000	2,5	-0,557	3,092	-4,865	-1,72177	2,70918	0,001	0,50000
2	2,000000	2,500000	2,25	1,376	3,092	-0,557	4,25539	-0,76644	0,001	0,25000
3	2,250000	2,500000	2,375	0,434	1,376	-0,557	0,59744	-0,24173	0,001	0,12500
4	2,375000	2,500000	2,4375	-0,056	0,434	-0,557	-0,02418	0,03102	0,001	0,06250
5	2,375000	2,437500	2,40625	0,191	0,434	-0,056	0,08276	-0,01062	0,001	0,03125
6	2,406250	2,437500	2,421875	0,068	0,191	-0,056	0,01293	-0,00378	0,001	0,01563
7	2,421875	2,437500	2,429688	0,006	0,068	-0,056	0,00042	-0,00034	0,001	0,00781
8	2,429688	2,437500	2,433594	-0,025	0,006	-0,056	-0,00015	0,00138	0,001	0,00391
9	2,429688	2,433594	2,431641	-0,009	0,006	-0,025	-0,00006	0,00023	0,001	0,00195
10	2,429688	2,431641	2,430664	-0,002	0,006	-0,009	-0,00001	0,00001	0,001	0,00098

Fim!!!

Solução: 2,430664