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1)

Método da bisseção

Com 10 iterações usando o seguinte algoritmo obtive

Questao 1:

Aproximação da raiz de f pelo método da bisseção no intervalo (-5, 5) é

itr	m	f(m)
1	0.0	-2.0
2	2.5	75.65625
3	1.25	-8.9482421875
4	1.875	6.174285888671875
5	1.5625	-5.186774253845215
6	1.71875	-0.750956803560257
7	1.796875	2.3572235433384776
8	1.7578125	0.7202352015592624
9	1.73828125	-0.03539848984200944
10	1.748046875	0.3373242720371934

Questao 2:

Aproximação da raiz de f pelo método da bisseção no intervalo (-5, 5) é

itr	m	f(m)

itr	m	f(m)
1	0.0	1.0
2	2.5	-1.5005505817755007
3	1.25	-1.2417037683761416
4	0.625	0.29967126146703604
5	0.9375	-0.2995062414291363
6	0.78125	0.03819656848050046
7	0.859375	-0.11991293324458152
8	0.8203125	-0.038302838557782826
9	0.80078125	0.0005670220287743444
10	0.810546875	-0.018710444810556504

Questao 3:

Aproximação da raiz de f pelo método da bisseção no intervalo (0.1, 5) é

itr	m	f(m)
1	2.55	7.438593359170334
2	1.325	2.0370374594381855
3	0.7125	0.1686808831606686
4	0.40625	-0.7357474828381898
5	0.559375	-0.2680347993280173
6	0.6359375	-0.04823848700487243
7	0.6742187500000001	0.06037025702132787
8	0.6550781250000001	0.006126574203116464
9	0.6455078125	-0.02103762974923168
10	0.6502929687500001	-0.007451351277187712

Questao 4:

Aproximação da raiz de f pelo método da bisseção no intervalo (0.1, 5) é

itr	m	f(m)
1	2.55	6.972186718340669
2	1.325	3.212824918876371
3	0.7125	0.7470492663213372
4	0.40625	-0.9890730906763796
5	0.559375	-0.04312037990603468
6	0.6359375	0.3665650181777551
7	0.59765625	0.165833453825746
8	0.578515625	0.06245180358838098
9	0.5689453124999999	0.009948702851761748
10	0.5641601562499999	-0.016513893124466827

Questao 5:

Aproximação da raiz de f pelo método da bisseção no intervalo (-5, 5) é

itr	m	f(m)
1	0.0	-1.0
2	2.5	14.62444962028836
3	1.25	0.4934562642013969
4	0.625	-0.8274792889196569
5	0.9375	-0.4581436348869481
6	1.09375	-0.09427649913792568
7	1.171875	0.1658834995506271
8	1.1328125	0.028080253372306352

itr	m	f(m)
9	1.11328125	-0.03493791165491533
10	1.123046875	-0.0039002199792643744

Questao 6:

Aproximação da raiz de f pelo método da bisseção no intervalo (-5, 5) é

itr	m	f(m)
1	0.0	6.0
2	-2.5	-1.248069545863772
3	-1.25	3.6471113871510976
4	-1.875	1.5141042163861589
5	-2.1875	0.22319656851808123
6	-2.34375	-0.4890492584419519
7	-2.265625	-0.12715813733919656
8	-2.2265625	0.049449349281731614
9	-2.24609375	-0.03849526846227658
10	-2.236328125	0.005566629407315 56

Questao 7:

Aproximação da raiz de f pelo método da bisseção no intervalo (0.1, 5) é

itr	m	f(m)
1	2.55	2.3082126612859457
2	1.325	1.8383128470235808
3	0.7125	1.4533445800149987
4	0.40625	0.704229693182775
5	0.253125	-0.11471557727075998

itr	m	f(m)
6	0.3296875	0.35653714422178817
7	0.29140625	0.1399895279803962
8	0.27226562499999996	0.01801900215483654
9	0.2626953125	-0.04691212612543261
10	0.26748046875	-0.014099600172050142

Questao 8:

Aproximação da raiz de f pelo método da bisseção no intervalo (0, 1) é

itr	m	f(m)
1	0.5	-0.2806043595274068
2	0.75	0.16157498874152432
3	0.625	-0.05821753144327424
4	0.6875	0.052785267517379
5	0.65625	-0.0025409530101213607
6	0.671875	0.025178426051899017
7	0.6640625	0.011331230768490741
8	0.66015625	0.004398066995682903
9	0.658203125	0.000929264665872287
10	0.6572265625	-0.0008056702936505289

Questao 9:

Aproximação da raiz de f pelo método da bisseção no intervalo (-5, 5) é

itr	m	f(m)
1	0.0	1.0806046117362795
2	2.5	-0.6455605383977385

itr	m	f(m)
3	1.25	-3.1296009945400636
4	0.625	-1.2111655746035868
5	0.3125	0.09259449131747066
6	0.46875	-0.5231415393256038
7	0.390625	-0.2051078091062018
8	0.3515625	-0.053655757028692797
9	0.33203125	0.02012308034668242
10	0.341796875	-0.016603189556635534

Questao 10:

Aproximação da raiz de f pelo método da bisseção no intervalo (-5, 5) é

itr	m	f(m)
1	0.0	0.001
2	-2.5	-9.374
3	-1.25	-0.389625
4	-0.625	0.147484375
5	-0.9375	0.055931640625
6	-1.09375	-0.111152099609375
7	-1.015625	-0.015117095947265624
8	-0.9765625	0.023351741790771485
9	-0.99609375	0.004875792026519775
10	-1.005859375	-0.004928240716457367

Método de Newton

Com 10 iterações usando o seguinte algoritmo e $x_0 = 1$ obtive

Questao 1:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	-9
1	-2.0	-18.0
2	-1.75	-4.4130859375
3	-1.636537109571156	-0.6466540841131092
4	-1.613330610320511	-0.023272257608629943
5	-1.6124311565485618	-3.395358932145598e-05
6	-1.612429840430743	-7.261569123784284e-11
7	-1.6124298404279283	3.552713678800501e-15
8	-1.6124298404279285	-3.552713678800501e-15
9	-1.6124298404279283	3.552713678800501e-15
10	-1.6124298404279285	-3.552713678800501e-15

Questao 2:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	-0.45969769413186023
1	0.8286590991016884	-0.05530143734578741
2	0.8016918646332476	-0.00121735733712236
3	0.8010710854190123	-6.272890075154081e-07
4	0.8010707652093035	-1.6686652060116103e-13
5	0.8010707652092184	0.0

Questao 3:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	1.0
1	0.6666666666666667	0.03897933633628026
2	0.6529092538420972	-2.6633692566946365e-05
3	0.6529186404138358	-1.5233758698940392e-11
4	0.6529186404192048	1.6653345369377348e-16
5	0.6529186404192047	-1.6653345369377348e-16
6	0.6529186404192048	1.6653345369377348e-16
7	0.6529186404192047	-1.6653345369377348e-16
8	0.6529186404192048	1.6653345369377348e-16
9	0.6529186404192047	-1.6653345369377348e-16
10	0.6529186404192048	1.6653345369377348e-16

Questao 4:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	2.0
1	0.5	-0.3862943611198906
2	0.5643823935199818	-0.01528172201816691
3	0.5671389877150601	-2.3778666176754726e-05
4	0.5671432903993691	-5.755684817643214e-11
5	0.5671432904097838	0.0

Questao 5:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	-0.33363325460711946
1	1.1520471396200649	0.09391511249412599
2	1.1253901330419582	0.0036866526207166572
3	1.1242555593941888	6.393829832695985e-06
4	1.1242535848362956	1.9329426947933825e-11
5	1.1242535848303261	0.0

Questao 6:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	4.367879441171443
1	2.5965878679450074	-1.7410885886629819
2	2.2617182870158685	-0.10936585144577737
3	2.2376849747104313	-0.0005446657857630655
4	2.2375640804545442	-1.3733969517204514e-08
5	2.2375640774059926	0.0

Questao 7:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	1.7165256995489035
1	-2.08953563789842	2.0829758765664725
2	2.775099524651682	2.4345131233977675

itr	xi	f(xi)
3	-1.4236712285153805	1.864362622862533
4	5.762348997148266	5.883411281975437
5	1.9213529163248246	2.0153989645905757
6	-3.456856263314581	2.8671838912209653
7	0.6485610955715524	1.352773617442165
8	-0.12732449203989704	-1.4256661415647742
9	-0.22010801271384234	-0.3737887679415399
10	-0.2640464644120241	-0.03757541228239836

Questao 8:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	0.5403023058681398
1	0.5639676834471323	-0.16722719381559137
2	0.6577444518000333	0.00011444175598684936
3	0.6576800342864524	-7.632974252658187e-10
4	0.6576800347160952	2.220446049250313e-16
5	0.657680034716095	0.0

Questao 9:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	-2.8234678295739304
1	0.12673695065196877	0.7173132660575705
2	0.36129404106243096	-0.09090273752971029

itr	xi	f(xi)
3	0.337646195373348	-0.0009535264316704595
4	0.33739281896345	-1.0993561194716506e-07
5	0.33739278974400283	-1.609823385706477e-15
6	0.3373927897440024	1.1102230246251565e-16
7	0.33739278974400244	5.551115123125783e-17
8	0.33739278974400244	5.551115123125783e-17
9	0.33739278974400244	5.551115123125783e-17
10	0.33739278974400244	5.551115123125783e-17

Questao 10:

Aproximação da raiz de f pelo método de Newton é

itr	xi	f(xi)
0	1	2.001
1	0.5998	0.576544111992
2	0.3468055107628918	0.16298576990143254
3	0.19223358662286574	0.04505750407855309
4	0.101268680379389	0.012293890944140417
5	0.048573815800885614	0.0034740213993098633
6	0.015242157152999411	0.001235864463759026
7	-0.024392658690151697	0.0015804881221962211
8	0.009234524947569683	0.0010860639385215538
9	-0.04876659346435304	0.0032622048697536097
10	-0.01267971551130815	0.0011587366018349539

Método da secantes

Com 10 iterações usando o seguinte algoritmo, $x_0 = 0.1$ e $x_1 = 0.5$ obtive

Questao 1:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	-2.79999
1	0.5	-5.96875
2	-0.25344929877933325	0.026548573781633333
3	-0.2501128503851133	-7.596551895305836e-05
4	-0.2501223699877199	5.022038784829874e-09
5	-0.2501223693584258	8.881784197001252e-16
6	-0.2501223693584257	0.0

Questao 2:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	0.8999500004166653
1	0.5	0.46891242171064473
2	0.9351476018571975	-0.2937678478927669
3	0.7675382121718456	0.06389457255576303
4	0.7974807772779245	0.007011838036328322
5	0.801171746403966	-0.00019783807243256568
6	0.8010704638766668	5.903083016844946e-07
7	0.8010707651839518	4.9497073106863354e-11
8	0.8010707652092184	0.0

Questao 3:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	-2.2925850929940457
1	0.5	-0.4431471805599453
2	0.5958447272180565	-0.16274423170762736
3	0.6514724463920976	-0.004103827471259092
4	0.6529114654314703	-2.0358474612180988e-05
5	0.6529186397806825	-1.811756633607331e-09
6	0.6529186404192044	-7.771561172376096e-16
7	0.6529186404192048	1.6653345369377348e-16
8	0.6529186404192047	-1.6653345369377348e-16
9	0.6529186404192048	1.6653345369377348e-16
10	0.6529186404192048	1.6653345369377348e-16

Questao 4:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	-4.405170185988091
1	0.5	-0.3862943611198906
2	0.5384480016754496	-0.16123269358475234
3	0.5659918963820679	-0.0063672436911001995
4	0.5671243548479135	-0.0001046474686408061
5	0.5671432781358889	-6.783101391683033e-08
6	0.5671432904096532	-7.223110998211268e-13
7	0.567143290409784	4.440892098500626e-16

itr	xn	f(xn)
8	0.5671432904097838	0.0

Questao 5:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	-0.999049997916718
1	0.5	-0.9054485732076625
2	4.36937945024704	82.38934689263071
3	0.5420617408666563	-0.8823733354457921
4	0.5826172029585522	-0.8571563186204179
5	1.9611454732676838	6.340247578055065
6	0.7467894842776736	-0.7203242534767296
7	0.8706788932512881	-0.5671381682267049
8	1.3293524885279426	0.9055779408487838
9	1.0473125981697864	-0.22165816060005117
10	1.1027725352958921	-0.06731041845674501

Questao 6:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	5.9800498337491685
1	0.5	5.5288007830714045
2	5.400886350690196	-24.169573373071447
3	1.412373995659804	3.141240514697916
4	1.8711254870829683	1.5290532767626916

itr	xn	f(xn)
5	2.306221023553494	-0.3137560725797659
6	2.232141810330114	0.024400131872654995
7	2.23748709912823	0.0003467877460439084
8	2.2375641645310482	-3.925053686515412e-07
9	2.237564077404594	6.299849530932988e-12
10	2.2375640774059926	0.0

Questao 7:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	-1.9004345787563115
1	0.5	1.018784183452689
2	0.36040317407637307	0.5080727233597395
3	0.22152761505429	-0.3617559696695034
4	0.27928503662481413	0.06392563251115968
5	0.2706114653753279	0.006993107745624005
6	0.26954607755813903	-0.00015119008070740847
7	0.2695686236604966	3.502560144141853e-07
8	0.2695685715495661	1.7503332117030368e-11
9	0.26956857154696184	4.440892098500626e-16
10	0.26956857154696173	0.0

Questao 8:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)

itr	xn	f(xn)
0	0.1	-0.8900499583472197
1	0.5	-0.2806043595274068
2	0.6841702426407182	0.04691282425401577
3	0.6577901116012747	0.00019555887495115165
4	0.6576796841457017	-6.228186359980015e-07
5	0.6576800347200901	7.097433751823701e-12
6	0.6576800347160952	2.220446049250313e-16
7	0.657680034716095	0.0

Questao 9:

Divisão por zero na iteração 9
Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	0.7979634350252283
1	0.5	-0.6556922078940559
2	0.3195742682008867	0.06649639315363093
3	0.3361871867367654	0.004533486421807786
4	0.3374026629721681	-3.714732249537889e-05
5	0.33739278432289804	2.0396429989411047e-08
6	0.33739278974397807	9.142686607788164e-14
7	0.3373927897440024	1.1102230246251565e-16
8	0.3373927897440024	1.1102230246251565e-16

Questao 10:

Aproximação da raiz de f pelo métodos das secantes é

itr	xn	f(xn)
0	0.1	0.012000000000000004
1	0.5	0.376
2	0.08681318681318682	0.009190799539791208
3	0.0764603462417925	0.007293185842103545
4	0.036670798783922084	0.0023940604478317152
5	0.017226801306864426	0.0013018749550461044
6	-0.005950262945105013	0.0010351949563129133
7	-0.09591869001032134	0.009317905248369767
8	0.0052942281262095044	0.0010281772425860523
9	0.017847694176133033	0.0013242253952523814
10	-0.03830404462726201	0.00241100014685771

Método da posição falsa

Com 10 iterações usando o seguinte algoritmo obtive

Questao 1:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (1, 2) é

itr	xn	f(xn)
0	1	-9
1	2	14
2	1.391304347826087	-7.917158858687301
3	1.6111841326980654	-4.032071988079089
4	1.6981255317843837	-1.4645405497337656
5	1.7267139918300782	-0.46393598031340133
6	1.7354797394300965	-0.14046656143964142

itr	xn	f(xn)
7	1.7381073932823883	-0.041942779688659115
8	1.7388896571099788	-0.012471911518350254
9	1.739122060437073	-0.0037039950016009016
10	1.7391910629370197	-0.0010996330689998501

Questao 2:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (-5, 5) é

itr	xn	f(xn)
0	-5	5.991202811863474
1	5	-4.008797188136526
2	0.9912028118634737	-0.4362441169018437
3	0.5845674854566185	0.35761247453303646
4	0.7677464964742944	0.0635085702603112
5	0.7961433244865453	0.009613432740394612
6	0.8003491325159903	0.0014128268356793372
7	0.8009652388150644	0.00020670738559447344
8	0.801055337193114	3.0222992985273756e-05
9	0.8010685096978147	4.418523451010792e-06
10	0.8010704354644471	6.459676205050613e-07

Questao 3:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (0.1, 5) é

itr	xn	f(xn)
0	0.1	-2.2925850929940457
1	5	26.6094379124341

itr	xn	f(xn)
2	0.4886809914157568	-0.4772362603145477
3	0.5681652794834566	-0.2425311327723116
4	0.608194295352534	-0.12736058244197324
5	0.6291146360067479	-0.06765656244642976
6	0.640199766692687	-0.036119274601862594
7	0.6461096758280346	-0.019328299587798248
8	0.6492699159941756	-0.010355329708960137
9	0.6509623876104933	-0.005551384687097316
10	0.6518695148137209	-0.002977003394622091

Questao 4:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (0.1, 5) é

itr	xn	f(xn)
0	0.1	-4.405170185988091
1	5	13.218875824868201
2	1.324766089355715	3.2120039937484357
3	0.8083076918461174	1.190990411273671
4	0.6575636853869595	0.47670005134049087
5	0.6031192564020956	0.19495785280796274
6	0.5817965781837383	0.08032432762982467
7	0.573168770016887	0.033187403866213216
8	0.569630694783083	0.013727325519571787
9	0.5681717848616645	0.005680634024435971
10	0.5675688371132847	0.002351198017251921

Questao 5:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (-5, 5) é

itr	xn	f(xn)
0	-5	-126.00874571514034
1	5	123.99125428485966
2	0.040349828605613765	-0.9999356314617289
3	0.08002727250612124	-0.9995079837802068
4	0.11937059621945155	-0.9984005611249163
5	0.15835640781627275	-0.9963432750213967
6	0.19695174949256639	-0.9931121035170993
7	0.2351162454946772	-0.9885288323067962
8	0.2728041407401267	-0.9824602853552238
9	0.3099662128509717	-0.9748166192623642
10	0.34655152634876585	-0.9655484410293571

Questao 6:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (2, 3) é

itr	xn	f(xn)
0	2	1.0183156388887342
1	3	-3.999876590195914
2	2.2029247968993175	0.1549282217222343
3	2.2326468775710846	0.022129667692458277
4	2.236868966875102	0.003131074675825296
5	2.237465873114658	0.00044240914522042374
6	2.2375502044070705	6.249879176678519e-05

itr	xn	f(xn)
7	2.237562117636234	8.828916306491408e-06
8	2.2375638005595047	1.247215556610115e-06
9	2.2375640382973376	1.7618762537807697e-07
10	2.2375640718813172	2.4889105887382357e-08

Questao 7:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (0.1, 5) é

itr	xn	f(xn)
0	0.1	-1.9004345787563115
1	5	4.546860067456818
2	1.5443468069782542	1.8960013309231232
3	0.8230167138339801	1.5843447642215367
4	0.4942992737137523	1.0023981109060995
5	0.358140945157697	0.4975076261676947
6	0.30458373740749567	0.21838172676740575
7	0.2834977424927381	0.0908108601987383
8	0.2751293176294341	0.03691799437218801
9	0.2717920710939684	0.014870736348410851
10	0.27045825001811236	0.005967751006024979

Questao 8:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (0, 1) é

itr	xn	f(xn)
0	0	-1.0
1	1	0.5403023058681398

itr	xn	f(xn)
2	0.6492232052047624	-0.015036777481989505
3	0.6587211007560034	0.001849343390552649
4	0.6576809050536021	1.5462296896195937e-06
5	0.657680035438952	1.2842180652228308e-09
6	0.6576800347166954	1.0667022820598504e-12
7	0.6576800347160956	8.881784197001252e-16
8	0.657680034716095	0.0

Questao 9:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (-5, 5) é

itr	xn	f(xn)
0	-5	6.999954600242
1	5	-6.452006229024708
2	0.20366858711971206	0.4725450508860771
3	0.5309797124111701	-0.7898538714832699
4	0.32618869515825394	0.04193931478910318
5	0.3365143326848618	0.0033037961277159744
6	0.33732435318236226	0.00025747854410679283
7	0.33738746086959015	2.004937426014486e-05
8	0.33739237482282053	1.561104283120951e-06
9	0.3373927574371692	1.2155162665283825e-07
10	0.3373927872285097	9.464321049090785e-09

Questao 10:

Aproximação da raiz de f pelo método da Posicao Falsa no intervalo (-5, 5) é

itr	xn	f(xn)
0	-5	-99.999
1	5	150.001
2	-1.00004	0.0009599967999359684
3	-1.0000783995033597	0.0009215882031942116
4	-1.0001152623378717	0.0008847110897839397
5	-1.0001506498025223	0.0008493048033325614
6	-1.0001846207663723	0.0008153110576801783
7	-1.0002172317636748	0.0007826738467956442
8	-1.000248537085365	0.000751339357916935
9	-1.0002785888670518	0.0007212558878127986
10	-1.0003074371736387	0.00069237376207154

2)

Questao 1:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (2, 3) com x0 = 0.5 é

itr	x	g(x)	f(x)
0	0.5	7.25	-6.75
1	7.25	4.107758620689655	45.5625
2	4.107758620689655	2.9059254803343344	9.873680885850174
3	2.9059254803343344	2.6573983059399398	1.4444028972563316
4	2.6573983059399398	2.6457768346169543	0.06176575641246185
5	2.6457768346169543	2.645751311187702	0.0001350585957107242
6	2.645751311187702	2.6457513110645907	6.514442318916736e-10
7	2.6457513110645907	2.6457513110645907	8.881784197001252e-16

itr	x	g(x)	f(x)
8	2.6457513110645907	2.6457513110645907	8.881784197001252e-16
9	2.6457513110645907	2.6457513110645907	8.881784197001252e-16
10	2.6457513110645907	2.6457513110645907	8.881784197001252e-16

Questao 2:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (2, 3) com x0 = 0.5 é

itr	x	g(x)	f(x)
0	0.5	22.25	-10.875
1	22.25	11.136109708370155	11004.140625
2	11.136109708370155	5.6124050649370805	1370.0216988262923
3	5.6124050649370805	2.980810747911499	165.78565569692822
4	2.980810747911499	2.109409982670013	15.485197174163591
5	2.109409982670013	2.2907682447178663	-1.6139472450674592
6	2.2907682447178663	2.1934784755750494	1.0210793115019392
7	2.1934784755750494	2.239870061529677	-0.44641211215910204
8	2.239870061529677	2.2162037939640884	0.23746817565225165
9	2.2162037939640884	2.2279092153717617	-0.1149837417293913
10	2.2279092153717617	2.2220259161225107	0.0584044467617062

Questao 3:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (2, 2.5) com x0 = 0.25 é

itr	x	g(x)	f(x)
0	0.25	6.6332495807108	-10.984375
1	6.6332495807108	1.2877547884506972	280.8629815512752
2	1.2877547884506972	2.9226698257841086	-8.864500272362772

itr	x	g(x)	f(x)
3	2.9226698257841086	1.9400211501975566	13.965442467742033
4	1.9400211501975566	2.3811848473113923	-3.6983771947459525
5	2.3811848473113923	2.14931360352882	2.501416372578216
6	2.14931360352882	2.262280483238776	-1.0711405645337315
7	2.262280483238776	2.2050737442595554	0.57815466052479
8	2.2050737442595554	2.233493965906477	-0.2781591997251063
9	2.233493965906477	2.219238360830697	0.1417741419895755
10	2.219238360830697	2.226354753363341	-0.07020912446026628

Questao 4:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (2, 3) com x0 = 0.5 é

itr	x	g(x)	f(x)
0	0.5	15.0	-10.875
1	15.0	10.016296296296296	3364.0
2	10.016296296296296	6.714078316184105	993.8968602948738
3	6.714078316184105	4.557391172607725	291.66291343045174
4	4.557391172607725	3.2147990316080515	83.65616834826373
5	3.2147990316080515	2.4979831476615413	22.22473200098578
6	2.4979831476615413	2.2529364878343587	4.587214518150125
7	2.2529364878343587	2.2243506650277465	0.4352811392909519
8	2.2243506650277465	2.223980152303198	0.005499597304853054
9	2.223980152303198	2.2239800905693174	9.160235698857377e-07
10	2.2239800905693174	2.2239800905693157	2.842170943040401e-14

Questao 5:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (1, 2) com x0 = 0.5 é

itr	x	g(x)	f(x)
0	0.5	0.6931471805599453	-0.3512787292998718
1	0.6931471805599453	0.8697416861919439	-0.3862943611198908
2	0.8697416861919439	1.0077693523972922	-0.35318901126399704
3	1.0077693523972922	1.1037784891091011	-0.27605533241069624
4	1.1037784891091011	1.1655095814085512	-0.192018273423618
5	1.1655095814085512	1.2032783120671362	-0.12346218459890013
6	1.2032783120671362	1.2257019934724969	-0.07553746131716998
7	1.2257019934724969	1.2387811009981406	-0.04484736281072177
8	1.2387811009981406	1.2463315316422	-0.026158215051288014
9	1.2463315316422	1.2506645006179395	-0.015100861288118939
10	1.2506645006179395	1.2531426110608315	-0.00866593795147974

Questao 6:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (1, 2) com x0 = 0.5 é

itr	x	g(x)	f(x)
0	0.5	1.6509636244473134	-4.375
1	1.6509636244473134	1.7811787446035972	-1.1509636244473134
2	1.7811787446035972	1.7947562143455076	-0.13021512015628378
3	1.7947562143455076	1.796160149270828	-0.013577469741910 43
4	1.796160149270828	1.7963051935286607	-0.001403934925320982
5	1.7963051935286607	1.7963201771024784	-0.00014504425783279373
6	1.7963201771024784	1.7963217249432655	-1.4983573817239915e-05
7	1.7963217249432655	1.7963218848389522	-1.5478407879854217e-06

itr	x	g(x)	f(x)
8	1.7963218848389522	1.7963219013565608	-1.5989568780128138e-07
9	1.7963219013565608	1.7963219030628694	-1.6517608614208257e-08
10	1.7963219030628694	1.796321903239135	-1.7063088719737607e-09

Questao 7:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (1, 2) com x0 = 0.5 é

itr	x	g(x)	f(x)
0	0.5	1.5137000520175454	-5.1875
1	1.5137000520175454	1.643240237987656	-2.041287847477921
2	1.643240237987656	1.6658122210610329	-0.40895063226380746
3	1.6658122210610329	1.6698371807924781	-0.07469187609456451
4	1.6698371807924781	1.670557588793337	-0.013425854520681568
5	1.670557588793337	1.6706866161089335	-0.0024064471180391678
6	1.6706866161089335	1.6707097280220784	-0.00043111177051180505
7	1.6707097280220784	1.6707138680119642	-7.722606208737659e-05
8	1.6707138680119642	1.6707146096027108	-1.383345989225404e-05
9	1.6707146096027108	1.6707147424429405	-2.4779724405732395e-06
10	1.6707147424429405	1.6707147662384487	-4.438762406522301e-07

Questao 8:

Aproximação da raiz de f pelo método do ponto fixo no intervalo (2, 3) com x0 = 0.5 é

itr	x	g(x)	f(x)
0	0.5	2.2397127693021015	3.479425538604203
1	2.2397127693021015	2.3922470398135642	0.305068541022925
2	2.3922470398135642	2.340579903497753	-0.10333427263162243

itr	x	g(x)	f(x)
3	2.340579903497753	2.359030656340122	0.03690150568473838
4	2.359030656340122	2.3525492338175287	-0.012962845045185745
5	2.3525492338175287	2.354839831502556	0.004581195370053859
6	2.354839831502556	2.354032010216767	-0.0016156425715774247
7	2.354032010216767	2.354317115460837	0.0005702104881395442
8	2.354317115460837	2.3542165193494866	-0.00020119222270054138
9	2.3542165193494866	2.3542520168198866	7.099494079954027e-05
10	2.3542520168198866	2.3542394911942455	-2.5051251282270925e-05

3)

Método da eliminação de Gauss

Questão 1:

Operaçoes:
L1 = L1 -0.5 * L0
L2 = L2 -0.25 * L0
L2 = L2 -0.3888888888888889 * L1
Solução = [1.0, -1.0, 3.0]

Questão 2:

Operaçoes:
L1 = L1 -0.6666666666666666 * L0
L2 = L2 -0.3333333333333333 * L0
L2 = L2 -0.4117647058823529 * L1
Solução = [1.0, -0.9999999999999999, 0.9999999999999998]

Questão 3:

Operaçoes:
L1 = L1 +0.0 * L0
L2 = L2 +4.0 * L0
L2 = L2 +4.5 * L1
Solução = [0.9411764705882355, 1.2352941176470589, -0.5294117647058824]

Questão 4:

Operaçoes:
L1 = L1 -0.3333333333333333 * L0
L2 = L2 -0.3333333333333333 * L0
L2 = L2 -0.7692307692307693 * L1
Solução = [1.0, -1.0, -0.9999999999999998]

Método iterativo de Jacobi

Questão 1:

Método de jacobi com chute inicial = [0, 0, 0]

itr	x	y	z
0	0	0	0
1	1.5	0.6	2.75
2	0.6625	-1.1	2.075
3	1.25625	-0.4950000000000001	3.134375
4	0.84015625	-1.15625	2.6834375
5	1.118203125	-0.8094375000000001	3.1180859375
6	0.922837890625	-1.094515625	2.87516796875
7	1.0548369140625	-0.91920234375	3.06654833984375
8	0.9631635009765624	-1.0485541015625	2.945891943359375
9	1.0256655395507812	-0.963622177734375	3.033486175537109
10	0.9825340005493164	-1.023660686035156	2.975394703979492

Questão 2:

Método de jacobi com chute inicial = [0, 0, 0]

itr	x	y	z
0	0	0	0
1	0.6666666666666666	-0.42857142857142855	0.6
2	0.7523809523809524	-0.7904761904761904	0.7238095238095238
3	0.9523809523809524	-0.8503401360544218	0.9238095238095237
4	0.92562358276644	-0.964625850340136	0.9197278911564626
5	1.0031746031746032	-0.955814706835115	0.9936507936507937
6	0.9726595400064788	-0.999092970521542	0.9728539034661484
7	1.008444012525645	-0.9844324124207506	1.0049238743116296
8	0.9879803168432906	-1.0038193962392212	0.9889706449473212
9	1.0062227158437071	-0.9934145605116035	1.0046955743748747
10	0.9940445155494441	-1.0031195114910234	0.9948041931382207

Questão 3:

Método de jacobi com chute inicial = [0, 0, 0]

itr	x	y	z
0	0	0	0
1	5.0	1.5	2.0
2	8.0	2.5	-16.5
3	-49.5	-6.75	-27.5
4	-64.0	-12.25	193.25
5	609.25	98.125	245.75
6	546.0	124.375	-2336.875

itr	x	y	z
7	-7254.375	-1166.9375	-2057.625
8	-3834.0	-1027.3125	27852.5625
9	85617.3125	13927.78125	14310.6875
10	15081.5	7156.84375	-328539.46875

Questão 4:

Método de jacobi com chute inicial = [0, 0, 0]

itr	x	y	z
0	0	0	0
1	0.3333333333333333	-0.75	-0.2
2	0.65	-0.7666666666666667	-0.7166666666666667
3	0.8277777777777778	-0.9458333333333333	-0.79
4	0.9119444444444444	-0.9380555555555555	-0.9330555555555555
5	0.957037037037037	-0.9885416666666667	-0.9452222222222222
6	0.9779212962962962	-0.9833518518518518	-0.9845324074074074
7	0.9892947530864197	-0.9977858796296297	-0.9855953703703703
8	0.9944604166666666	-0.9954739969135802	-0.9965304783950618
9	0.9973348251028806	-0.9996501350308642	-0.9961764814814813
10	0.9986088721707818	-0.9987545344650205	-0.9992570460390947

Método iterativo de Gauss-Seidel

Questão 1:

Método de Seidel com chute inicial = [0, 0, 0]

itr	x	y	z

itr	x	y	z
0	0	0	0
1	1.5	0.0	2.375
2	0.90625	-0.7125	2.8796875
3	0.9582031249999999	-0.93515625	2.97802734375
4	0.9892822265625	-0.986923828125	2.996141357421875
5	0.9976956176757813	-0.9975347900390625	2.999343490600586
6	0.9995478248596191	-0.999556526184082	2.999891306877136
7	0.9999163048267365	-0.999923044681549	2.9999824461340903
8	0.9999851496368647	-0.999987038308382	2.999997231744975
9	0.9999974516408519	-0.9999978733543307	2.9999995737669525
10	0.9999995748968445	-0.9999996594655188	2.9999999360085483

Questão 2:

Método de Seidel com chute inicial = [0, 0, 0]

itr	x	y	z
0	0	0	0
1	0.6666666666666666	-0.619047619047619	0.838095238095238
2	0.7999999999999999	-0.8965986394557823	0.9779591836734693
3	0.9384126984126985	-0.9761062520246194	0.997981211532232
4	0.9847437641723357	-0.9950642787727336	1.0000898144291732
5	0.9966795810387646	-0.9990769701336966	1.0001102658724652
6	0.9993478914649759	-0.9998451878106974	1.0000375343934234
7	0.9998842804093239	-0.9999776613722134	1.0000097407414632
8	0.9999818606676545	-0.9999976004026051	1.000002188108032

itr	x	y	z
9	0.9999976708990594	-0.9999999597163118	1.0000004416499753
10	0.9999998259275494	-1.0000000764507213	1.000000080684923

Questão 3:

Método de Seidel com chute inicial = [0, 0, 0]

itr	x	y	z
0	0	0	0
1	5.0	1.5	-16.5
2	-47.5	-6.75	185.25
3	574.25	94.125	-2200.875
4	-6785.875	-1098.9375	26046.5625
5	80342.5625	13024.78125	-308343.46875
6	-951074.96875	-154170.234375	3650131.640625
7	11258740.390625	1825067.3203125	-43209892.2421875
8	-133279806.3671875	-21604944.62109375	511514282.84765625
9	1577752742.7851562	255757142.92382812	-6055253826.216797
10	-18677275759.498047	-3027626911.6083984	71681476128.38379

Questão 4:

Método de Seidel com chute inicial = [0, 0, 0]

itr	x	y	z
0	0	0	0
1	0.3333333333333333	-0.6666666666666666	-0.6666666666666667
2	0.7777777777777778	-0.888888888888889	-0.888888888888889
3	0.9259259259259259	-0.962962962962963	-0.962962962962963

itr	x	y	z
4	0.9753086419753086	-0.9876543209876544	-0.9876543209876545
5	0.991769547325103	-0.9958847736625515	-0.9958847736625515
6	0.9972565157750344	-0.9986282578875172	-0.9986282578875173
7	0.9990855052583448	-0.9995427526291725	-0.9995427526291725
8	0.9996951684194483	-0.9998475842097242	-0.9998475842097243
9	0.9998983894731496	-0.9999491947365747	-0.9999491947365747
10	0.9999661298243833	-0.9999830649121916	-0.9999830649121917