Hoja de Trabajo no. 2 Métodos numéricos
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1 Ejercicio 1

1.1 Inciso A

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Estimado(%)
1	0	2.5	1.25	-9	-7.046875	63.421875	
2	1.25	2.5	1.875	-7.046875	-2.40820313	16.9703064	33.33333333
3	1.875	2.5	2.1875	-2.40820313	1.4675293	-3.53410864	14.28571429
4	1.875	2.1875	2.03125	-2.40820313	-0.61911011	1.4909429	7.692307692
5	2.03125	2.1875	2.109375	-0.61911011	0.38558578	-0.23872006	3.703703704
6	2.03125	2.109375	2.0703125	-0.61911011	-0.1262393	0.07815603	1.886792453
7	2.0703125	2.109375	2.08984375	-0.1262393	0.12728161	-0.01606794	0.934579439
8	2.0703125	2.08984375	2.08007813	-0.1262393	-7.3962E-05	9.3369E-06	0.469483568
9	2.08007813	2.08984375	2.08496094	-7.3962E-05	0.06345469	-4.6932E-06	0.234192037
10	2.08007813	2.08496094	2.08251953	-7.3962E-05	0.03165313	-2.3411E-06	0.117233294
11	2.08007813	2.08251953	2.08129883	-7.3962E-05	0.01578028	-1.1671E-06	0.058651026
12	2.08007813	2.08129883	2.08068848	-7.3962E-05	0.00785083	-5.8066E-07	0.029334116
13	2.08007813	2.08068848	2.0803833	-7.3962E-05	0.00388785	-2.8755E-07	0.014669209
14	2.08007813	2.0803833	2.08023071	-7.3962E-05	0.0019068	-1.4103E-07	0.007335143
15	2.08007813	2.08023071	2.08015442	-7.3962E-05	0.00091638	-6.7777E-08	0.003667706

1.2 Inciso B

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Estimado(%)
1	0.5	1.6	1.05	-5.875	-2.474625	14.5384219	
2	1.05	1.6	1.325	-2.474625	1.40923438	-3.48732662	20.75471698
3	1.05	1.325	1.1875	-2.474625	-0.75366211	1.8650311	11.57894737
4	1.1875	1.325	1.25625	-0.75366211	0.26961987	-0.20320228	5.472636816
5	1.1875	1.25625	1.221875	-0.75366211	-0.25619711	0.19308606	2.813299233
6	1.221875	1.25625	1.2390625	-0.25619711	0.00312169	-0.00079977	1.387137453
7	1.221875	1.2390625	1.23046875	-0.25619711	-0.12742943	0.03264705	0.698412698
8	1.23046875	1.2390625	1.23476563	-0.12742943	-0.06237751	0.00794873	0.347991142
9	1.23476563	1.2390625	1.23691406	-0.06237751	-0.02968391	0.00185161	0.173693352
10	1.23691406	1.2390625	1.23798828	-0.02968391	-0.01329513	0.00039465	0.086771318
11	1.23798828	1.2390625	1.23852539	-0.01329513	-0.00509022	6.7675E-05	0.043366844
12	1.23852539	1.2390625	1.23879395	-0.00509022	-0.00098515	5.0146E-06	0.021678721
13	1.23879395	1.2390625	1.23892822	-0.00098515	0.00106805	-1.0522E-06	0.010838186
14	1.23879395	1.23892822	1.23886108	-0.00098515	4.1398E-05	-4.0783E-08	0.005419387
15	1.23879395	1.23886108	1.23882751	-0.00098515	-0.00047189	4.6488E-07	0.002709767

1.3 Inciso C

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Estimado(%)
1	2	3	2.5	1	-0.5	-0.5	
2	2	2.5	2.25	1	0.25	0.25	11.11111111
3	2.25	2.5	2.375	0.25	-0.22855339	-0.05713835	5.263157895
4	2.25	2.375	2.3125	0.25	-0.00384172	-0.00096043	2.702702703
5	2.25	2.3125	2.28125	0.25	0.12120484	0.03030121	1.369863014
6	2.28125	2.3125	2.296875	0.12120484	0.05798266	0.00702778	0.680272109
7	2.296875	2.3125	2.3046875	0.05798266	0.02686757	0.00155785	0.338983051
8	2.3046875	2.3125	2.30859375	0.02686757	0.01145873	0.00030787	0.169204738
9	2.30859375	2.3125	2.31054688	0.01145873	0.00379453	4.348E-05	0.084530854
10	2.31054688	2.3125	2.31152344	0.00379453	-2.7143E-05	-1.0299E-07	0.042247571
11	2.31054688	2.31152344	2.31103516	0.00379453	0.00188281	7.1444E-06	0.021128248
12	2.31103516	2.31152344	2.3112793	0.00188281	0.00092761	1.7465E-06	0.010563008
13	2.3112793	2.31152344	2.31140137	0.00092761	0.00045018	4.1759E-07	0.005281225
14	2.31140137	2.31152344	2.3114624	0.00045018	0.0002115	9.5215E-08	0.002640543
15	2.3114624	2.31152344	2.31149292	0.0002115	9.2178E-05	1.9496E-08	0.001320254

2 Ejercicio 2

2.1 Inciso A

a	b	c
1	-6	-10

x1	7.35889894
x2	-1.35889894

2.2 Inciso B

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Porcentual(%)	Verdadero(%)
1	7	7.5	7.25	-3	-0.9375	2.8125		
2	7.25	7.5	7.375	-0.9375	0.140625	-0.13183594	1.694915254	0.125

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Porcentual(%)	Verdadero(%)
1	-1	-1.5	-1.25	-3	-0.9375	2.8125		
2	-1.25	-1.5	-1.375	-0.9375	0.140625	-0.13183594	9.090909091	0.125

3 Ejercicio 3

3.1 Inciso A y B

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Estimado(%)
1	3	4	3.5	42	95.1875	3997.875	
2	3.5	4	3.75	95.1875	133.01953	12661.797	6.666666667
3	3.75	4	3.875	133.01953	155.28345	20655.731	3.225806452
4	3.875	4	3.9375	155.28345	167.32448	25982.722	1.587301587
5	3.9375	4	3.96875	167.32448	173.58157	29044.446	0.787401575
6	3.96875	4	3.984375	173.58157	176.77045	30684.093	0.392156863
7	3.984375	4	3.9921875	176.77045	178.38012	31532.334	0.195694716
8	3.9921875	4	3.9960938	178.38012	179.18878	31963.716	0.097751711
9	3.9960938	4	3.9980469	179.18878	179.59407	32181.243	0.048851979
10	3.9980469	4	3.9990234	179.59407	179.79696	32290.467	0.024420024
11	3.9990234	4	3.9995117	179.79696	179.89846	32345.195	0.012208522
12	3.9995117	4	3.9997559	179.89846	179.94922	32372.588	0.006103888
13	3.9997559	4	3.9998779	179.94922	179.97461	32386.291	0.003051851
14	3.9998779	4	3.999939	179.97461	179.98731	32393.145	0.001525902
15	3.999939	4	3.9999695	179.98731	179.99365	32396.572	0.000762945
16	3.9999695	4	3.9999847	179.99365	179.99683	32398.286	0.000381471
17	3.9999847	4	3.9999924	179.99683	179.99841	32399.143	0.000190735
18	3.9999924	4	3.9999962	179.99841	179.99921	32399.572	9.53675E-05
19	3.9999962	4	3.9999981	179.99921	179.9996	32399.786	4.76837E-05
20	3.9999981	4	3.999999	179.9996	179.9998	32399.893	2.38419E-05
21	3.999999	4	3.9999995	179.9998	179.9999	32399.946	1.19209E-05
22	3.9999995	4	3.9999998	179.9999	179.99995	32399.973	5.96046E-06
23	3.9999998	4	3.9999999	179.99995	179.99998	32399.987	2.98023E-06
24	3.9999999	4	3.9999999	179.99998	179.99999	32399.993	1.49012E-06
25	3.9999999	4	4	179.99999	179.99999	32399.997	7.45058E-07
26	4	4	4	179.99999	180	32399.998	3.72529E-07
27	4	4	4	180	180	32399.999	1.86265E-07
28	4	4	4	180	180	32400	9.31323E-08
29	4	4	4	180	180	32400	4.65661E-08
30	4	4	4	180	180	32400	2.32831E-08
31	4	4	4	180	180	32400	1.16415E-08
32	4	4	4	180	180	32400	5.82077E-09
33	4	4	4	180	180	32400	2.91038E-09
34	4	4	4	180	180	32400	1.45519E-09
35	4	4	4	180	180	32400	7.27596E-10

4 Ejercicio 4

4.1 Inciso A

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Estimado(%)
1	2	4	3	-0.6	#¡DIV/0!	#¡DIV/0!	
2	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!

4.2 Inciso B

En el intervalo de 2 a 4 no funciona el método de bisección porque se genera un cero en el denominador de la función ya que para el valor de x se toma el resultado de la raíz.

Iteración	Xa	Xb	Xr	f(Xa)	f(Xr)	f(Xa)*f(Xr)	Estimado(%)
1	2	3	2.5	-0.6	-1.90909091	1.14545455	
2	2.5	3	2.75	-1.90909091	-4.56521739	8.71541502	9.090909091

4.3 Inciso C

No se puede utilizar el método de Newton para x0 = 0 porque la derivada de la función se hace cero.

Iteración	Xi	f(x0)	f'(x0)	Xi+1	Estimado(%)
1	0	0.11111111	0	#¡DIV/0!	

5 Ejercicio 5

5.1 Inciso A

Iteración	Xi	f(xi)	f'(xi)	Xi+1
1	3	45	30	1.5
2	1.5	16.875	9.75	-0.23076923
3	-0.23076923	8.29540282	3.15976331	-2.85609334
4	-2.85609334	-22.8662023	27.4718076	-2.02374177
5	-2.02374177	-5.35952197	15.2865923	-1.67313898
6	-1.67313898	-0.70319219	11.3981821	-1.61144561
7	-1.61144561	-0.01886945	10.7902709	-1.60969687
8	-1.60969687	-1.4779E-05	10.773372	-1.60969549
9	-1.60969549	-9.0878E-12	10.7733588	-1.60969549
10	-1.60969549	0	10.7733588	-1.60969549

5.2 Inciso B

Iteración	Xi	f(Xi-1)	f(Xi)	Xi+1	Real(%)
0	0				
1	3	9	45	-0.75	
2	-0.75	45	6.328125	-1.36363636	0.45
3	-1.36363636	6.328125	2.37340346	-1.73190671	0.21263867
4	-1.73190671	2.37340346	-1.39057576	-1.59585181	0.08525535
5	-1.59585181	-1.39057576	0.14822016	-1.60895691	0.00814509
6	-1.60895691	0.14822016	0.00795438	-1.60970009	0.00046169
7	-1.60970009	0.00795438	-4.955E-05	-1.60969549	2.8582E-06
8	-1.60969549	-4.955E-05	1.6407E-08	-1.60969549	9.461E-10
9	-1.60969549	1.6407E-08	3.3751E-14	-1.60969549	1.9312E-15