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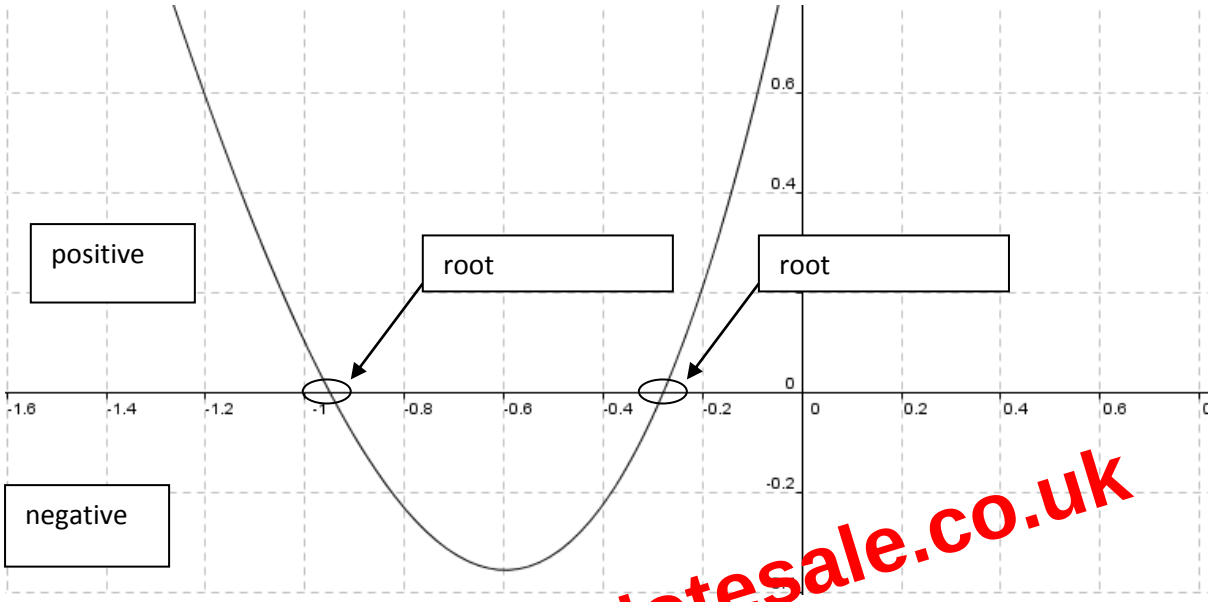
However from the above graph, there are two other roots between x=-1 and x=0 or [-1,0].Below is an image of the graph that has been zoomed in to locate the other two roots.



I can see that the two other roots specified on the graph above have been missed by the Decimal search method. Thus I can conclude that the Decimal search method has failed in this instance.

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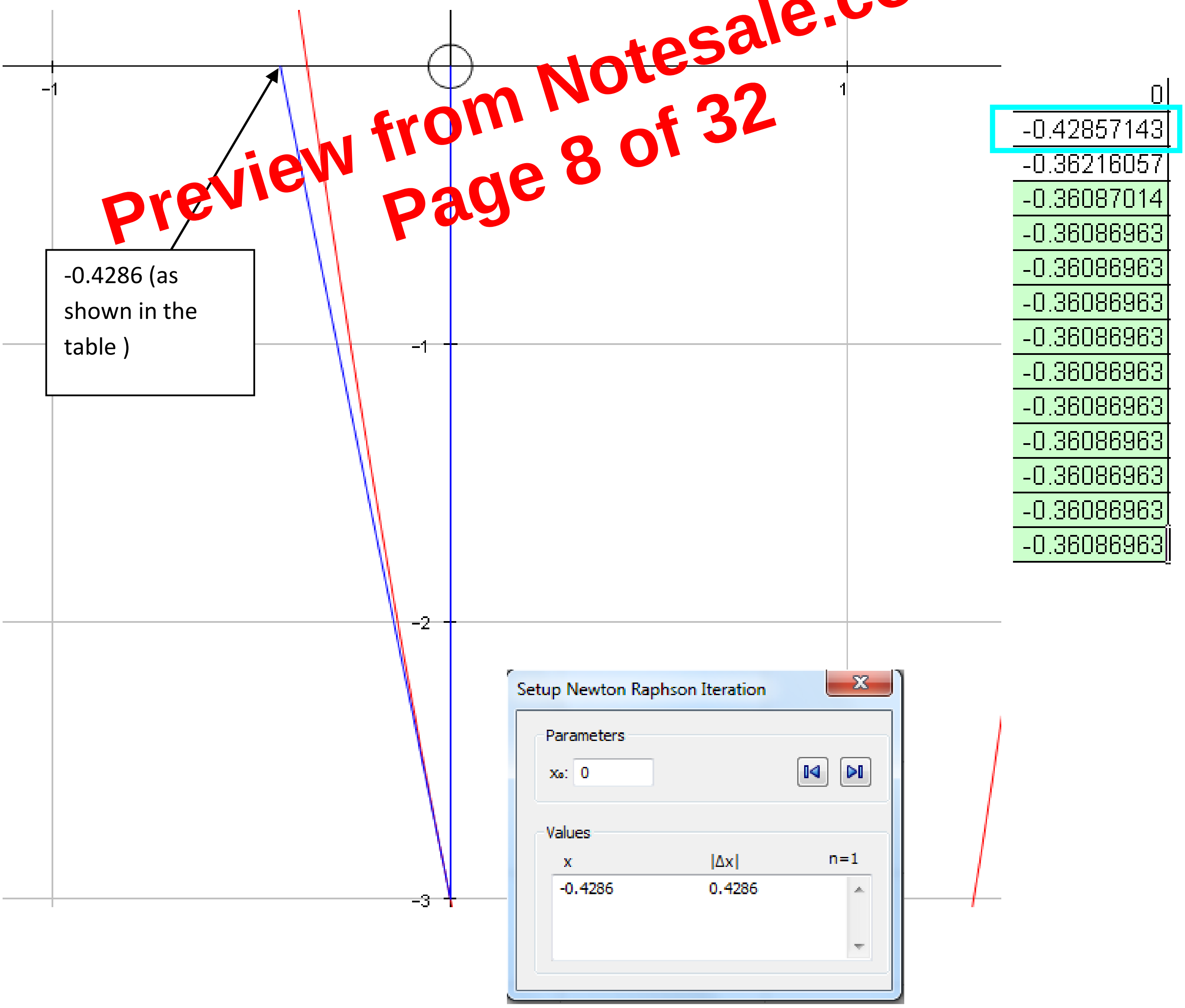
The table below shows the location of the three roots. Each root is highlighted in a different colour.

-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
-5.37736	-5.25	-6.77778	3.75	-0.27273	-0.41667	-0.42857	2.25	1.666667	2.113636	2.671233	3.268519	3.885906
-5.23616	-5.22913	-5.69201	2.526846	-0.36355	-0.36176	-0.36216	1.757757	1.593434	1.705384	1.947183	2.257313	2.605024
-5.22899	-5.22897	-5.28952	1.878532	-0.36087	-0.36087	-0.36087	1.605564	1.589852	1.597662	1.650542	1.760719	1.915303
-5.22897	-5.22897	-5.23022	1.631691	-0.36087	-0.36087	-0.36087	1.590004	1.589844	1.589884	1.592122	1.606079	1.641472
-5.22897	-5.22897	-5.22897	1.590948	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589847	1.590014	1.591507
-5.22897	-5.22897	-5.22897	1.589845	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589846
-5.22897	-5.22897	-5.22897	1.589844	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589844
-5.22897	-5.22897	-5.22897	1.589844	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589844
-5.22897	-5.22897	-5.22897	1.589844	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589844
-5.22897	-5.22897	-5.22897	1.589844	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589844
-5.22897	-5.22897	-5.22897	1.589844	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589844
-5.22897	-5.22897	-5.22897	1.589844	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589844
-5.22897	-5.22897	-5.22897	1.589844	-0.36087	-0.36087	-0.36087	1.589844	1.589844	1.589844	1.589844	1.589844	1.589844

The graphs below show the Newton-Raphson iteration for the function. This has been done on Autograph, with x_n = 0 (the starting value)



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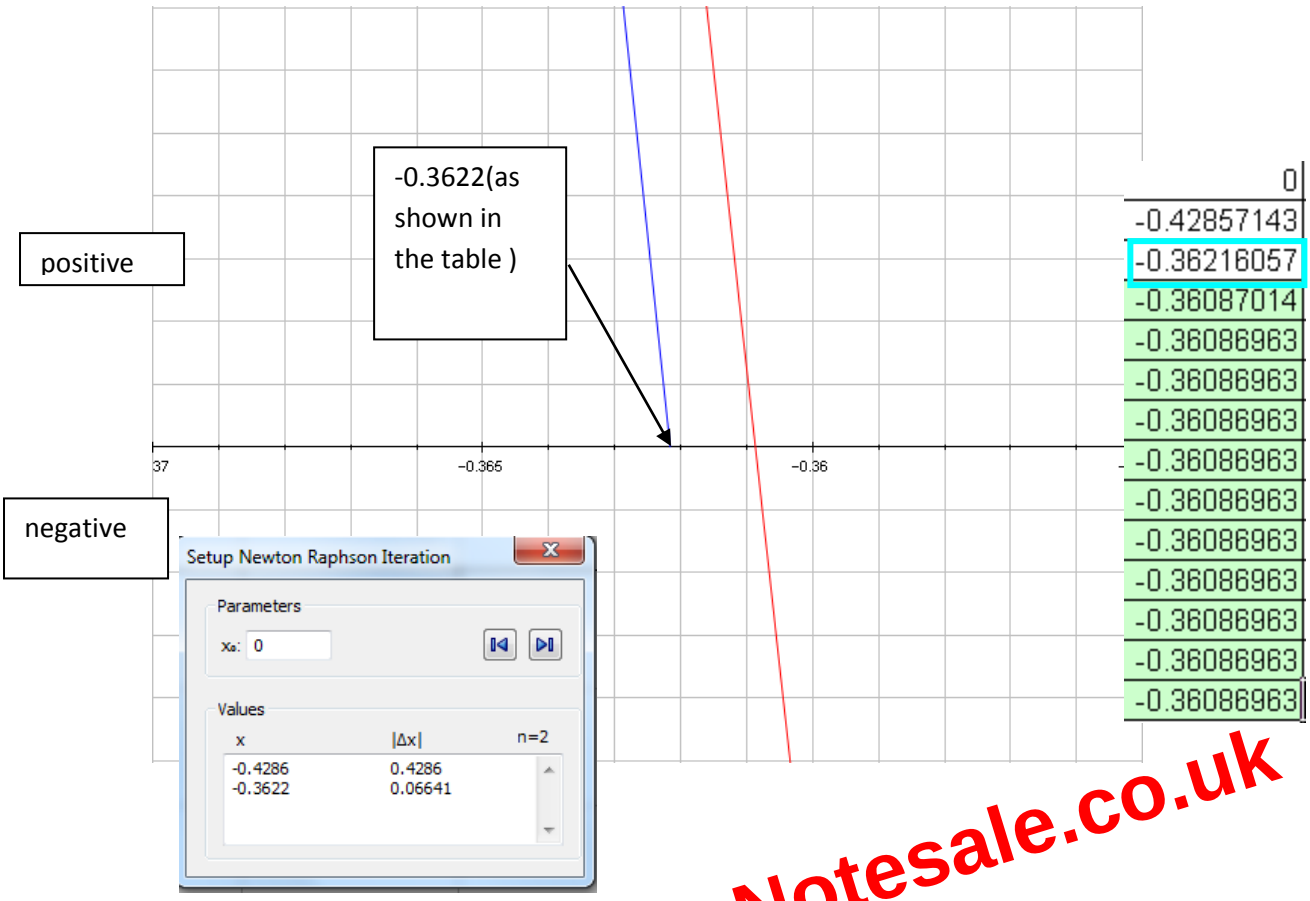

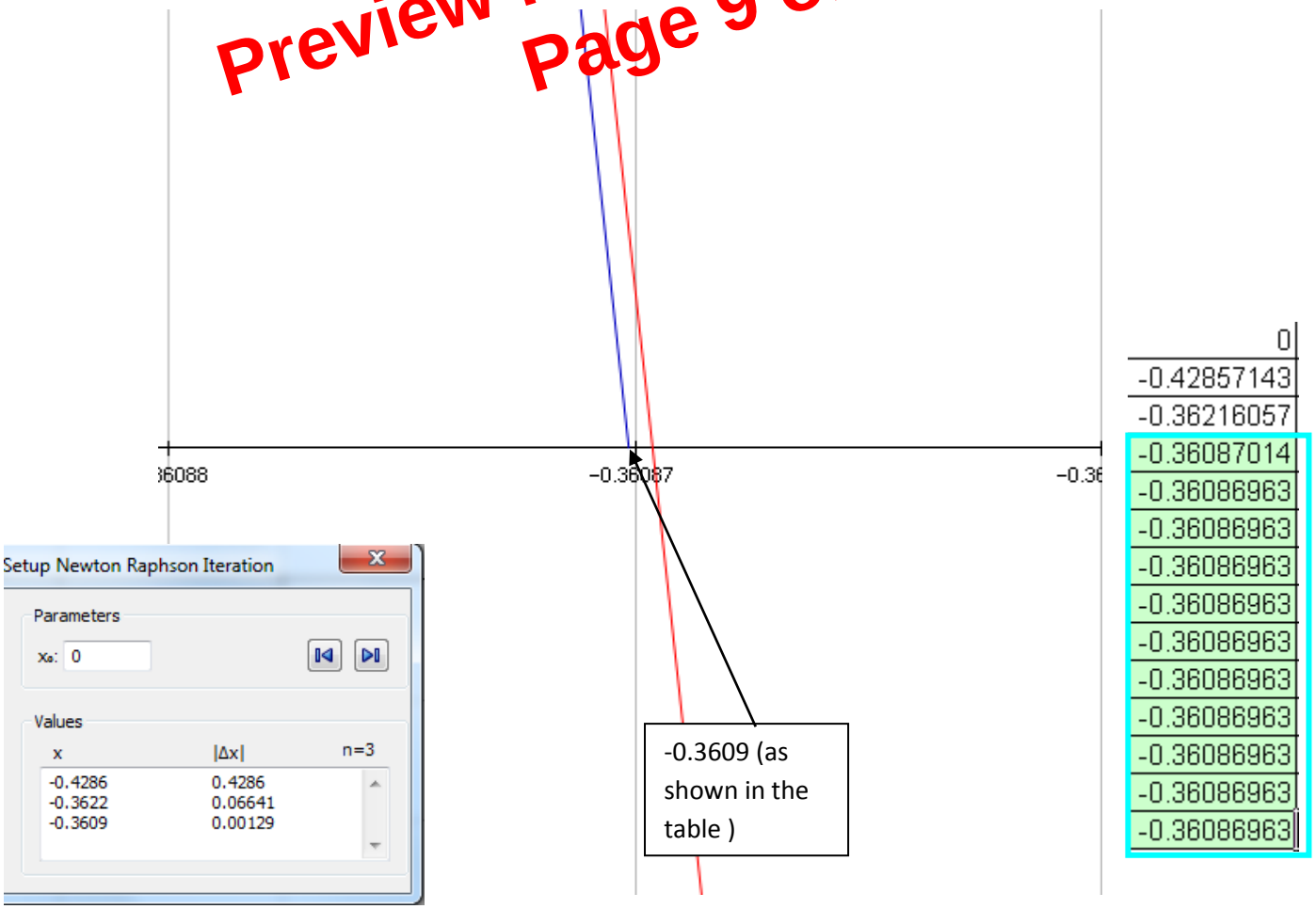

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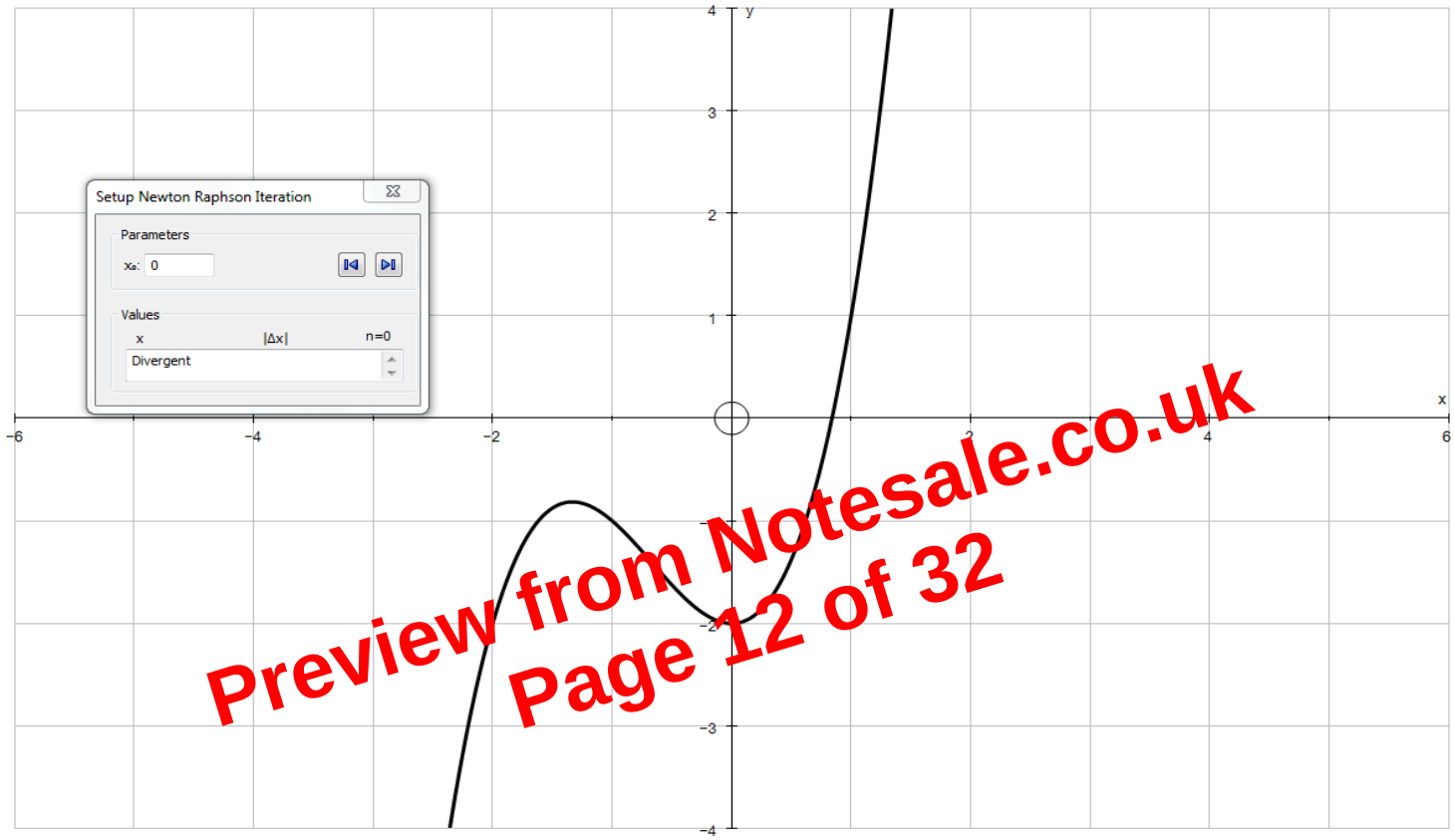

If I use the Newton-Raphson iteration feature on Autograph when $x_n = 0$, it appears as divergent

instead of the value where the tangent hits the x axis .Therefore the tangent of this function does not hit the x axis at a particular value, hence the word divergent appearing. The method will draw a tangent at -2, and then try to find the x axis. However it will fail as this line (the tangent) is parallel to the x axis.

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0.34992	#NUM!	#NUM!	0.34992	#NUM!	0.350025	0.350038	0.350032	0.34992	#NUM!	#NUM!	#NUM!	#NUM!
0.350008	#NUM!	#NUM!	0.350008	#NUM!	0.349915	0.349904	0.349909	0.350008	#NUM!	#NUM!	#NUM!	#NUM!
0.349931	#NUM!	#NUM!	0.349931	#NUM!	0.350012	0.350022	0.350017	0.349931	#NUM!	#NUM!	#NUM!	#NUM!
0.349998	#NUM!	#NUM!	0.349998	#NUM!	0.349927	0.349918	0.349922	0.349998	#NUM!	#NUM!	#NUM!	#NUM!
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0.349991	#NUM!	#NUM!	0.349991	#NUM!	0.349936	0.34993	0.349932	0.349991	#NUM!	#NUM!	#NUM!	#NUM!
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0.349967	#NUM!	#NUM!	[illegible]	#NUM!	0.349966	[illegible]	[illegible]	0.349967	#NUM!	#NUM!	#NUM!	#NUM!
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0.349967	#NUM!	#NUM!	0.349967	#NUM!	[illegible]	0.349966	0.349966	0.349967	#NUM!	#NUM!	#NUM!	#NUM!
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