

second dz

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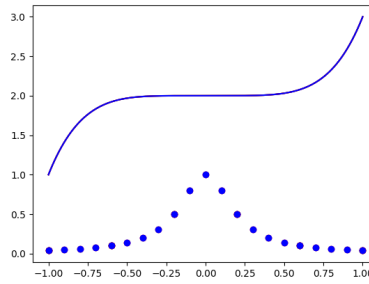
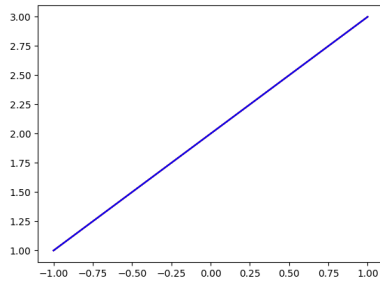
1 Интерполяционный многочлен Лагранжа

Примечание: График f обозначен красным цветом

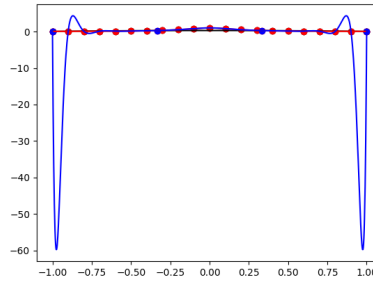
График P_5 обозначен синим цветом

График P_{20} обозначен чёрным цветом

Для начала проверим корректность многочлена Лагранжа. Построим его для полинома $x^5 + 2$. И для полинома $x + 2$. Для P_5 , P_{20} они должны совпадать на отрезке $[-1; 1]$ в независимости от выбранных данных. На 2 графике точки стоят по приколу, они ничего значат, они остались с предыдущих вычислений

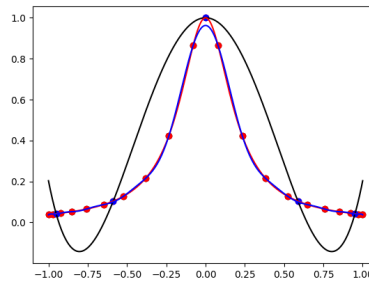


x	$f(x)$	$P_5(x)$	$P_{20}(x)$
-1	1	1	1
-0.999999	1.999999	1.999999	1.999999
-0.999998	1.999996	1.999996	1.999996
-0.999997	1.999991	1.999991	1.999991
-0.999996	1.999984	1.999984	1.999984
-0.999995	1.999975	1.999975	1.999975
-0.999994	1.999964	1.999964	1.999964
-0.999993	1.999951	1.999951	1.999951
-0.999992	1.999936	1.999936	1.999936
-0.999991	1.999919	1.999919	1.999919
-0.999990	1.999900	1.999900	1.999900
-0.999989	1.999879	1.999879	1.999879
-0.999988	1.999856	1.999856	1.999856
-0.999987	1.999831	1.999831	1.999831
-0.999986	1.999804	1.999804	1.999804
-0.999985	1.999775	1.999775	1.999775
-0.999984	1.999744	1.999744	1.999744
-0.999983	1.999711	1.999711	1.999711
-0.999982	1.999676	1.999676	1.999676
-0.999981	1.999639	1.999639	1.999639
-0.999980	1.999600	1.999600	1.999600
-0.999979	1.999559	1.999559	1.999559
-0.999978	1.999516	1.999516	1.999516
-0.999977	1.999471	1.999471	1.999471
-0.999976	1.999424	1.999424	1.999424
-0.999975	1.999375	1.999375	1.999375
-0.999974	1.999324	1.999324	1.999324
-0.999973	1.999271	1.999271	1.999271
-0.999972	1.999216	1.999216	1.999216
-0.999971	1.999159	1.999159	1.999159
-0.999970	1.999100	1.999100	1.999100
-0.999969	1.999039	1.999039	1.999039
-0.999968	1.998976	1.998976	1.998976
-0.999967	1.998911	1.998911	1.998911
-0.999966	1.998844	1.998844	1.998844
-0.999965	1.998775	1.998775	1.998775
-0.999964	1.998704	1.998704	1.998704
-0.999963	1.998631	1.998631	1.998631
-0.999962	1.998556	1.998556	1.998556
-0.999961	1.998479	1.998479	1.998479
-0.999960	1.998400	1.998400	1.998400
-0.999959	1.998319	1.998319	1.998319
-0.999958	1.998236	1.998236	1.998236
-0.999957	1.998151	1.998151	1.998151
-0.999956	1.998064	1.998064	1.998064
-0.999955	1.997975	1.997975	1.997975
-0.999954	1.997884	1.997884	1.997884
-0.999953	1.997791	1.997791	1.997791
-0.999952	1.997696	1.997696	1.997696
-0.999951	1.997599	1.997599	1.997599
-0.999950	1.997500	1.997500	1.997500
-0.999949	1.997400	1.997400	1.997400
-0.999948	1.997298	1.997298	1.997298
-0.999947	1.997194	1.997194	1.997194
-0.999946	1.997088	1.997088	1.997088
-0.999945	1.996980	1.996980	1.996980
-0.999944	1.996870	1.996870	1.996870
-0.999943	1.996758	1.996758	1.996758
-0.999942	1.996644	1.996644	1.996644
-0.999941	1.996528	1.996528	1.996528
-0.999940	1.996410	1.996410	1.996410
-0.999939	1.996290	1.996290	1.996290
-0.999938	1.996168	1.996168	1.996168
-0.999937	1.996044	1.996044	1.996044
-0.999936	1.995918	1.995918	1.995918
-0.999935	1.995790	1.995790	1.995790
-0.999934	1.995660	1.995660	1.995660
-0.999933	1.995528	1.995528	1.995528
-0.999932	1.995394	1.995394	1.995394
-0.999931	1.995258	1.995258	1.995258
-0.999930	1.995120	1.995120	1.995120
-0.999929	1.994980	1.994980	1.994980
-0.999928	1.994838	1.994838	1.994838
-0.999927	1.994694	1.994694	1.994694
-0.999926	1.994548	1.994548	1.994548
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-0.999924	1.994250	1.994250	1.994250
-0.999923	1.994098	1.994098	1.994098
-0.999922	1.993944	1.993944	1.993944
-0.999921	1.993788	1.993788	1.993788
-0.999920	1.993630	1.993630	1.993630
-0.999919	1.993470	1.993470	1.993470
-0.999918	1.993308	1.993308	1.993308
-0.999917	1.993144	1.993144	1.993144
-0.999916	1.992978	1.992978	1.992978
-0.999915	1.992810	1.992810	1.992810
-0.999914	1.992640	1.992640	1.992640
-0.999913	1.992468	1.992468	1.992468
-0.999912	1.992294	1.992294	1.992294
-0.999911	1.992118	1.992118	1.992118
-0.999910	1.991940	1.991940	1.991940
-0.999909	1.991760	1.991760	1.991760
-0.999908	1.991578	1.991578	1.991578
-0.999907	1.991394	1.991394	1.991394
-0.999906	1.991208	1.991208	1.991208
-0.999905	1.991020	1.991020	1.991020
-0.999904	1.990830	1.990830	1.990830
-0.999903	1.990638	1.990638	1.990638
-0.999902	1.990444	1.990444	1.990444
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-0.999896	1.989238	1.989238	1.989238
-0.999895	1.989030	1.989030	1.989030
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-0.999892	1.988394	1.988394	1.988394
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-0.999871	1.983438	1.983438	1.983438
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-0.999851	1.977898	1.977898	1.977898
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-0.999849	1.977300	1.977300	1.977300
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-0.999825	1.969548	1.969548	1.969548
-0.999824	1.969200	1.969200	1.969200
-0.999823	1.968850	1.968850	1.968850
-0.999822	1.968498	1.968498	1.968498
-0.999821	1.968144	1.968144	1.968144
-0.999820	1.967788	1.967788	1.967788
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-0.999794	1.957830	1.957830	1.957830
-0.999793	1.95742	1.95742	1.95742



2 Узлы Чебышёва

Сгенерируем узлы Чебышёва для отрезка $[-1; 1]$. И сформируем полином по ним. А потом запустим его на значениях, которые мы сгенерировали до этого.



Построив по узлам Чебышёва, ситуация меняется. Теперь P_{20} становится выгоднее P_5 . И чем больше у нас узлов, тем более точное приближение мы получим