

Test of Dr. H. T. Lau's femlagsym Self-Adjoint Second Order Linear Ordinary Differential Equation Solver by James Pate Williams, Jr.

The first ODE was for the fourth degree Legendre polynomial and the second was an ODE whose analytic solution is the sine trigonometric function.

2nd Order ODE Boundary Value Problem Dialog

Equation
 Legendre
 Other

25
Points

-1.000000	+1.000000	+0.000000
-0.920000	+0.334548	+0.000000
-0.840000	-0.092386	+0.000000
-0.760000	-0.330322	+0.000000
-0.680000	-0.422237	+0.000000
-0.600000	-0.406740	+0.000000
-0.520000	-0.318140	+0.000000
-0.440000	-0.186454	+0.000000
-0.360000	-0.037411	+0.000000
-0.280000	+0.107551	+0.000000
-0.200000	+0.231279	+0.000000
-0.120000	+0.320911	+0.000000
-0.040000	+0.367871	+0.000000
+0.040000	+0.367871	+0.000000

Compute Clear OK Cancel

2nd Order ODE Boundary Value Problem Dialog

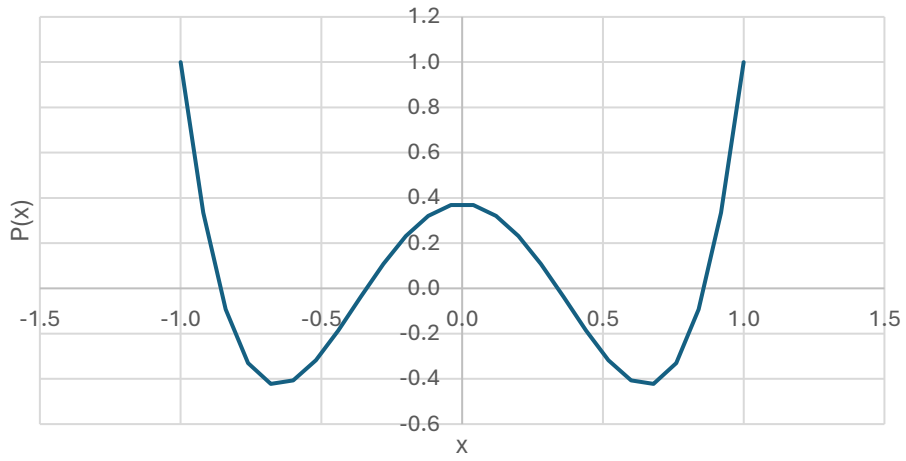
Equation
 Legendre
 Other

25
Points

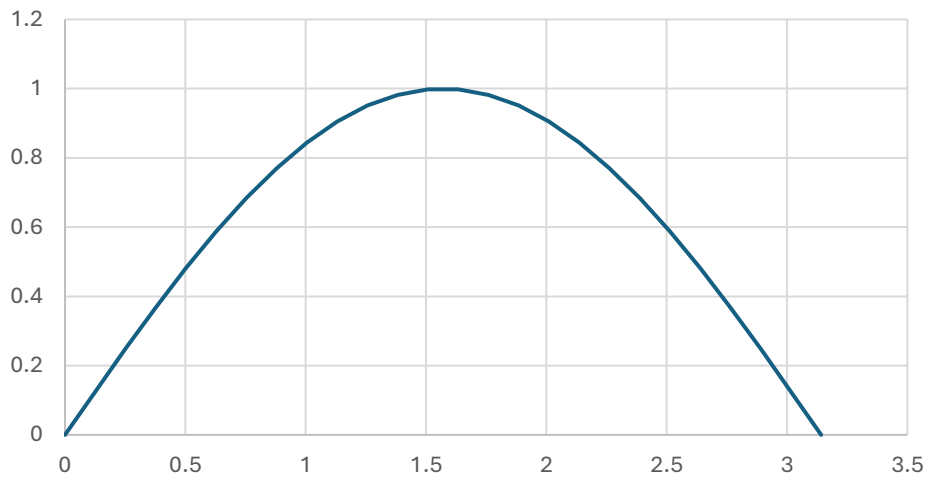
+0.000000	+0.000000	+0.000000
+0.125664	+0.125334	+0.000000
+0.251327	+0.248691	+0.000001
+0.376991	+0.368126	+0.000001
+0.502655	+0.481755	+0.000001
+0.628319	+0.587787	+0.000002
+0.753982	+0.684549	+0.000002
+0.879646	+0.770515	+0.000002
+1.005310	+0.844330	+0.000002
+1.130973	+0.904829	+0.000002
+1.256637	+0.951058	+0.000002
+1.382301	+0.982289	+0.000002
+1.507964	+0.998028	+0.000002
+1.633628	+0.998028	+0.000002

Compute Clear OK Cancel

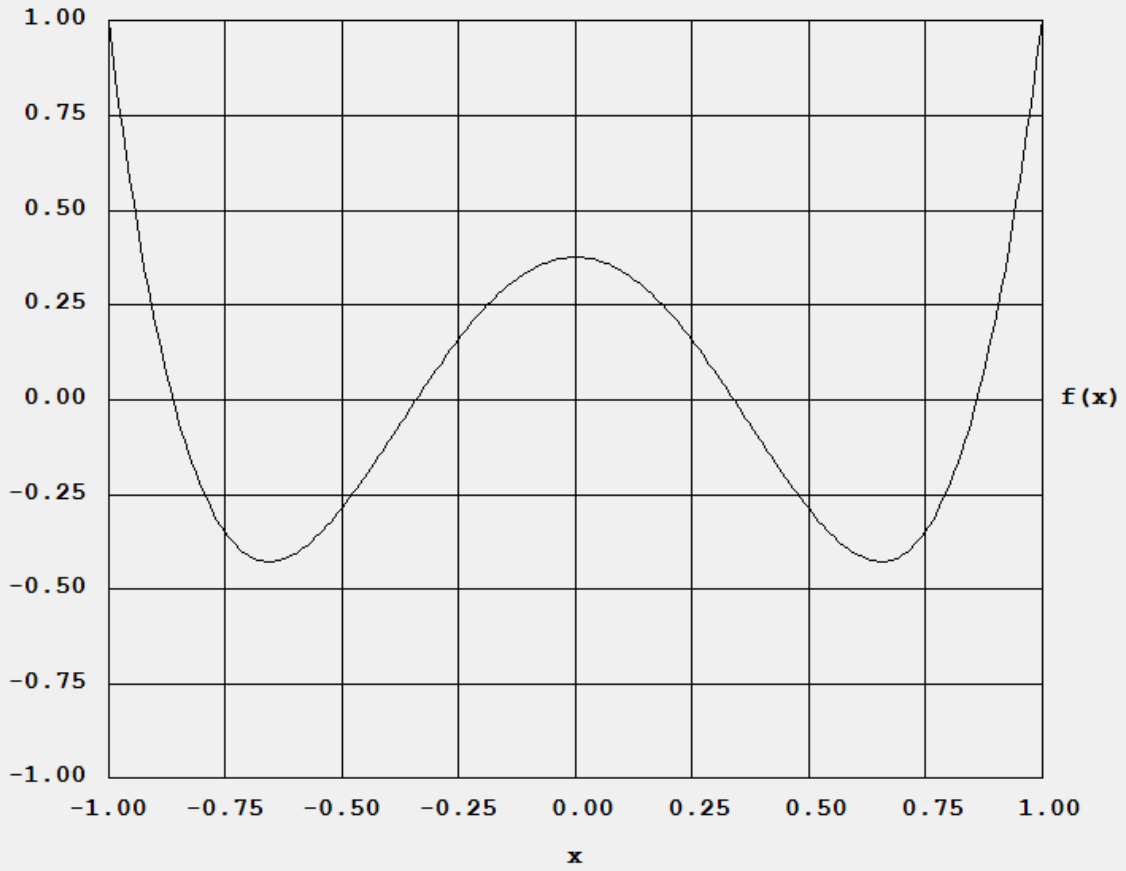
Legendre Polynomial of Degree 4



f(x)



Legendre Polynomial of Degree $n = 4$



Draw

Legendre

4

Polynomial