

A line plot showing the absolute error of various approximation methods for the function  $f(x) = \cos(x)$  on the interval  $[-3, 3]$ . The x-axis ranges from -3 to 3, and the y-axis ranges from 0 to 0.0001. The plot compares the absolute error of Taylor series (original, optimized degree 7, 11, 15) and Chebyshev series (degree 7, 11, 15). The Chebyshev degree 15 error is the lowest, followed by Taylor optimized degree 15, Chebyshev degree 11, Taylor optimized degree 11, Chebyshev degree 7, Taylor optimized degree 7, and Taylor original has the highest error.

Approximation Method	Approximate Maximum Absolute Error
Absolute Error of Taylor original	0.00008
Absolute Error of Taylor optimized degree 7	0.00004
Absolute Error of Chebyshev degree 7	0.00004
Absolute Error of Taylor optimized degree 11	0.00002
Absolute Error of Chebyshev degree 11	0.00002
Absolute Error of Taylor optimized degree 15	0.00001
Absolute Error of Chebyshev degree 15	0.000005

