Advanced Numerical Analysis
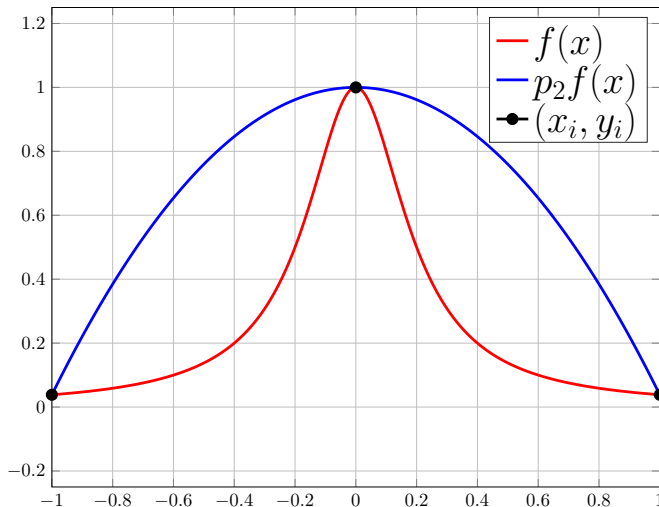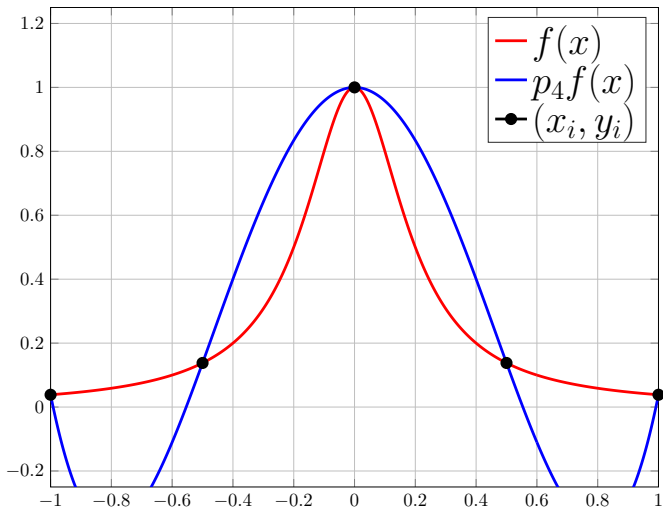## Lecture 6
Spring 2025

Fabio Matti

Runge phenomenon

Interpolating polynomial $p_n f(x)$ of $f(x) = \dfrac{1}{1 + 25x^2}$ at uniform nodes

Runge phenomenon

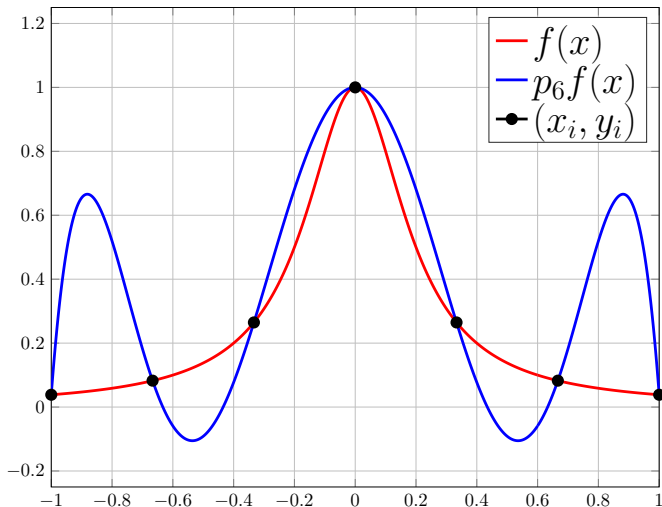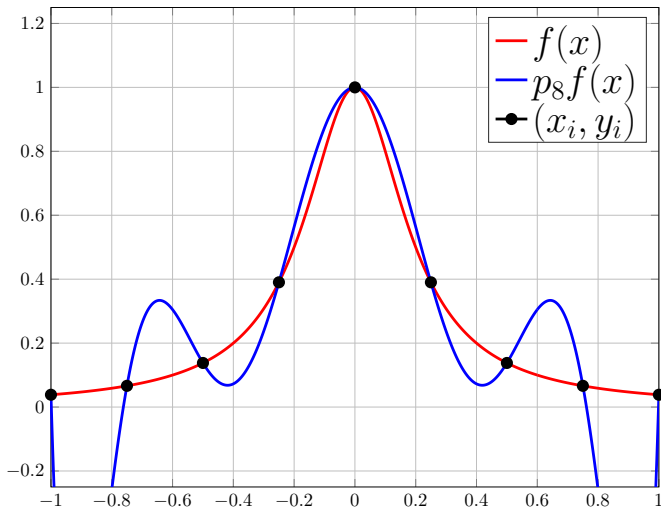Interpolating polynomial $p_n f(x)$ of $f(x) = \dfrac{1}{1 + 25x^2}$ at uniform nodes

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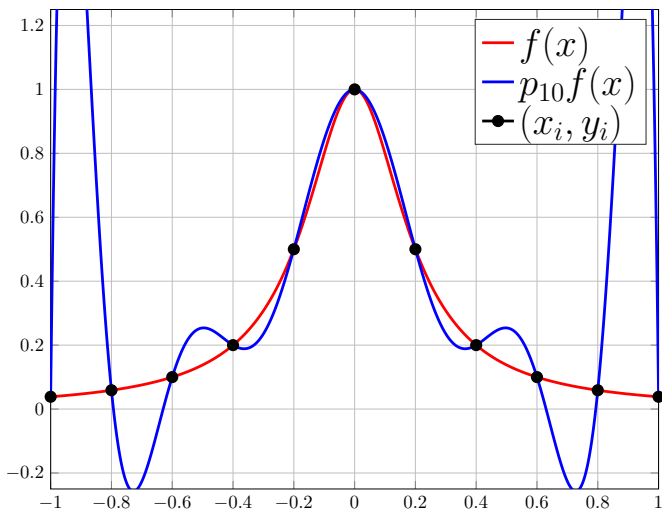Interpolating polynomial $p_n f(x)$ of $f(x) = \dfrac{1}{1 + 25x^2}$ at uniform nodes

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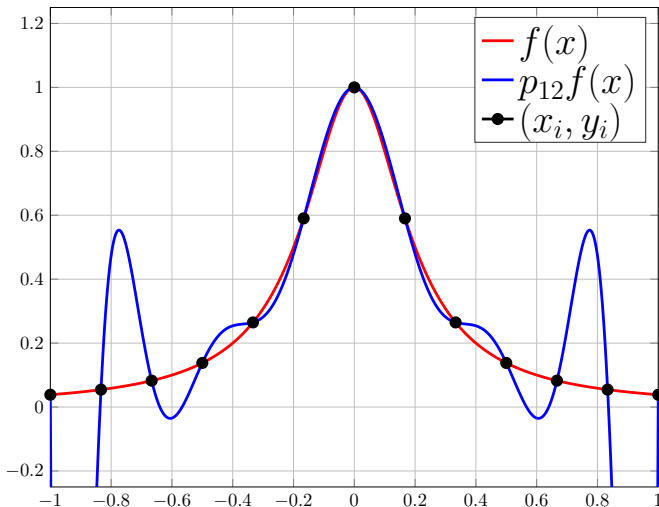
Runge phenomenon

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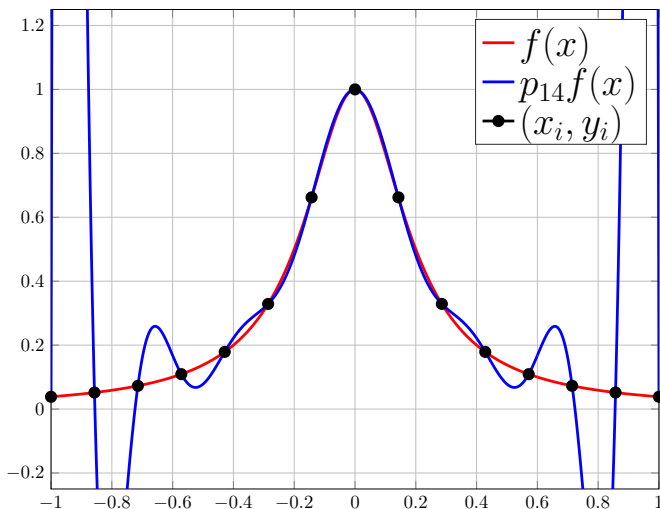
Runge phenomenon

Interpolating polynomial $p_n f(x)$ of $f(x) = \dfrac{1}{1 + 25x^2}$ at uniform nodes
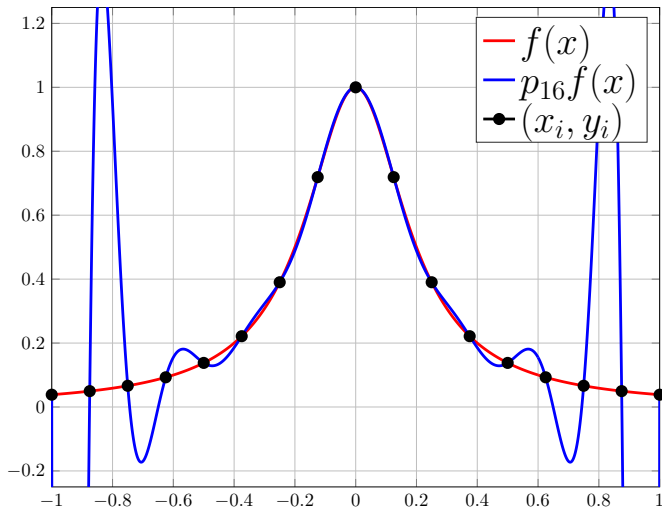
Runge phenomenon

Interpolating polynomial $p_n f(x)$ of $f(x) = \dfrac{1}{1 + 25x^2}$ at uniform nodes
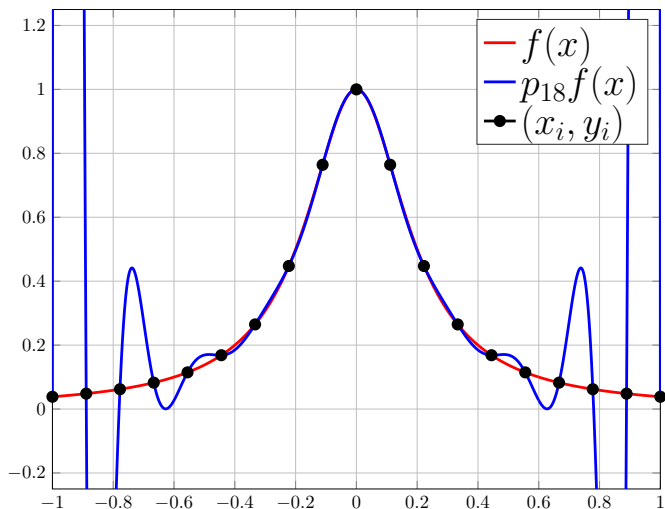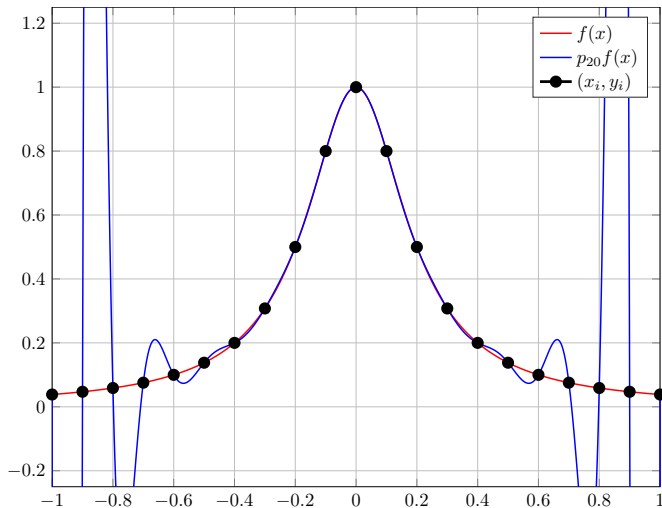
Runge phenomenon

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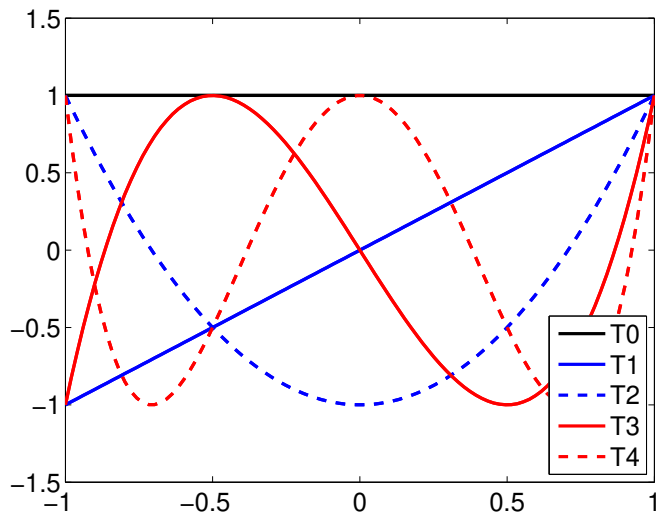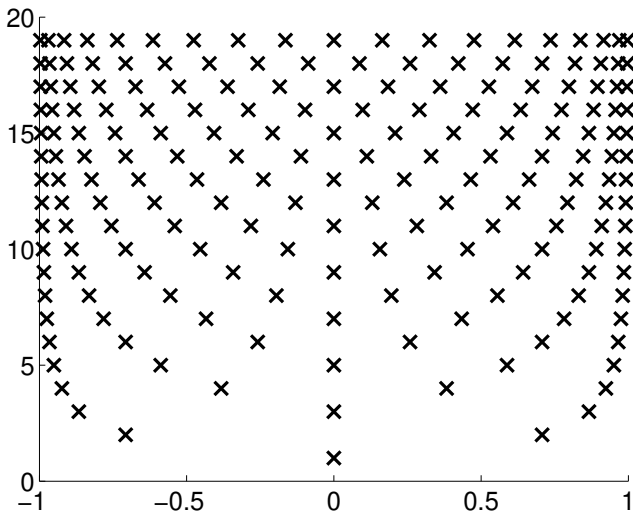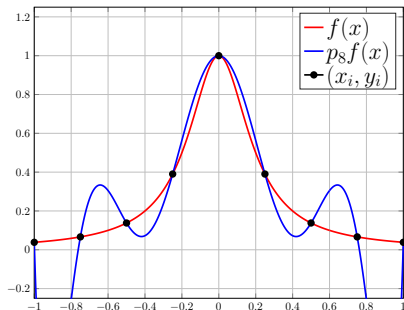
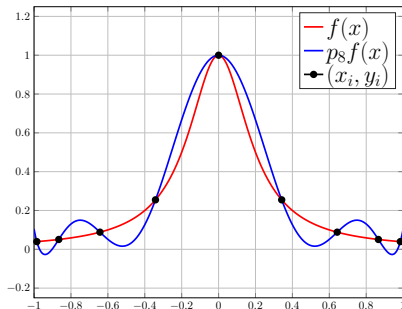# Chebyshev polynomials

Chebyshev nodes

Runge phenomenon: Uniform vs Chebyshev nodes

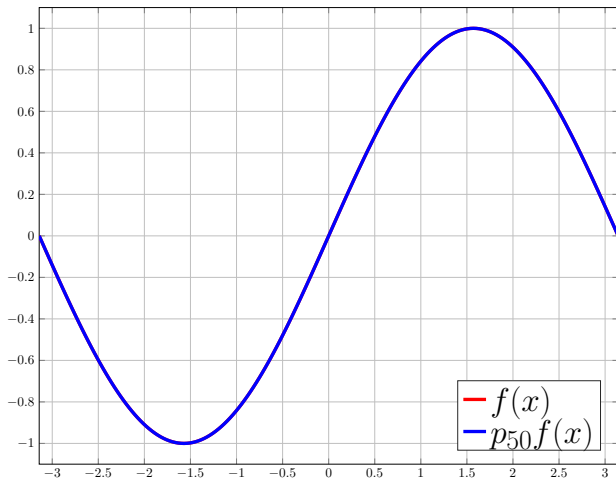Interpolating polynomial $p_8 f(x)$ of $f(x) = \dfrac{1}{1 + 25x^2}$

Uniform nodes
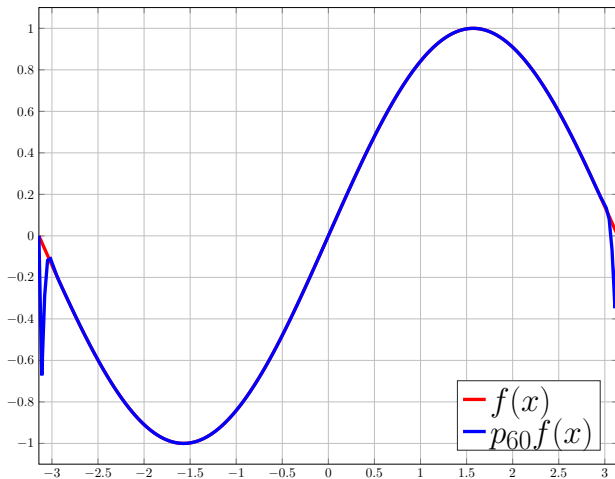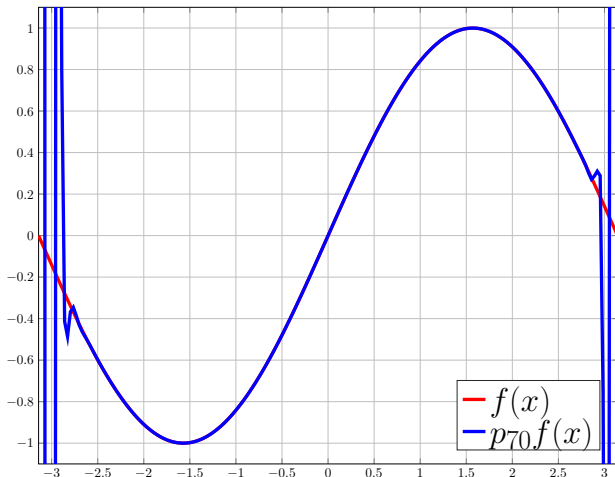
Chebyshev nodes

Roundoff for uniform nodes

Interpolating polynomial $p_n f(x)$ of $f(x) = \sin(x)$ at uniform nodes

Roundoff for uniform nodes

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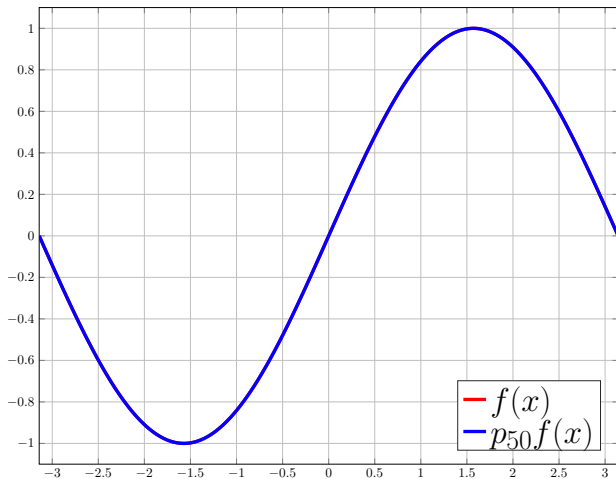
Roundoff for uniform nodes

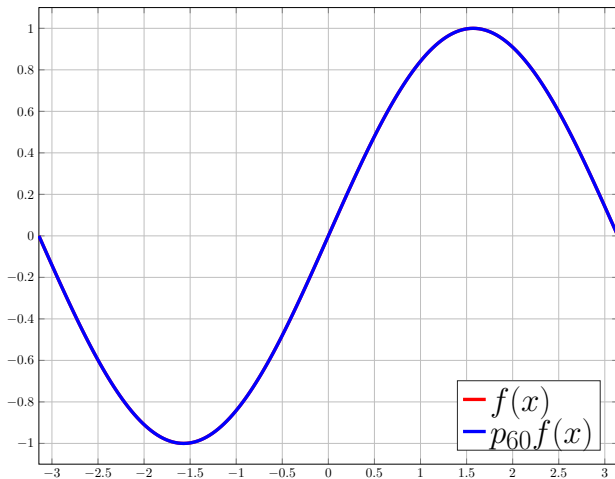Interpolating polynomial $p_n f(x)$ of $f(x) = \sin(x)$ at uniform nodes

Roundoff for Chebyshev nodes

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