

Interpolação Polinomial

Parte II: fenômeno de Runge e nós de Chebyshev

Elias S. Helou Neto

Interpolação Polinomial

Erro na Aproximação de Funções

$$f(x) - p(x) = \frac{f^{(n+1)}(\xi_x)}{(n+1)!} (x - x_0) \cdots (x - x_n).$$

Interpolação Polinomial

Fenômeno de Runge

$$f(x) = \frac{1}{1 + 25x^2}.$$

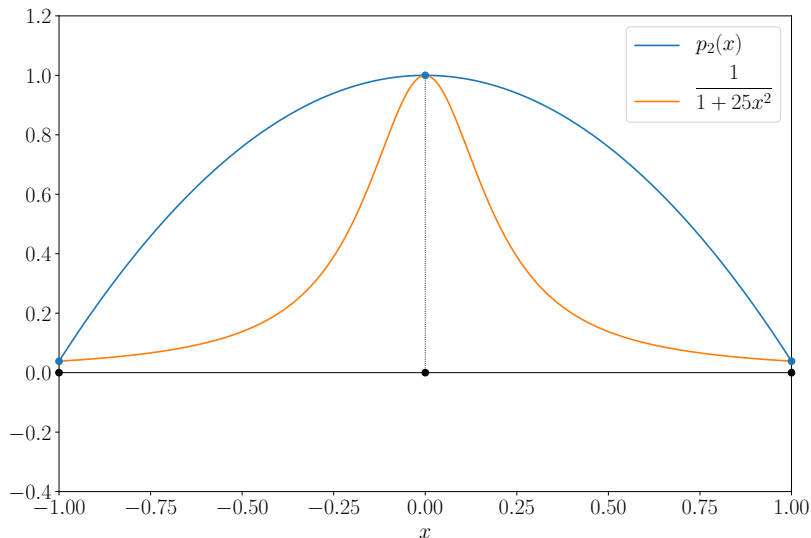
Interpolação Polinomial

Fenômeno de Runge

$$x_i = -1 + \frac{2}{n}i.$$

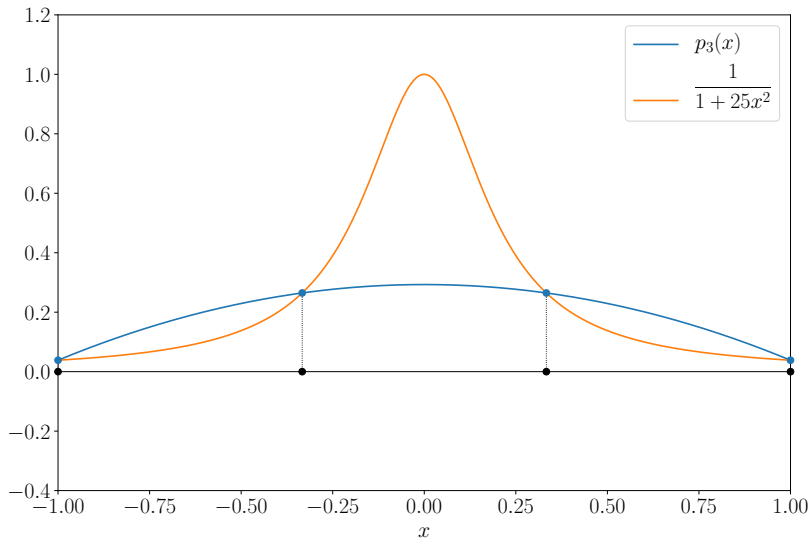
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Fenômeno de Runge



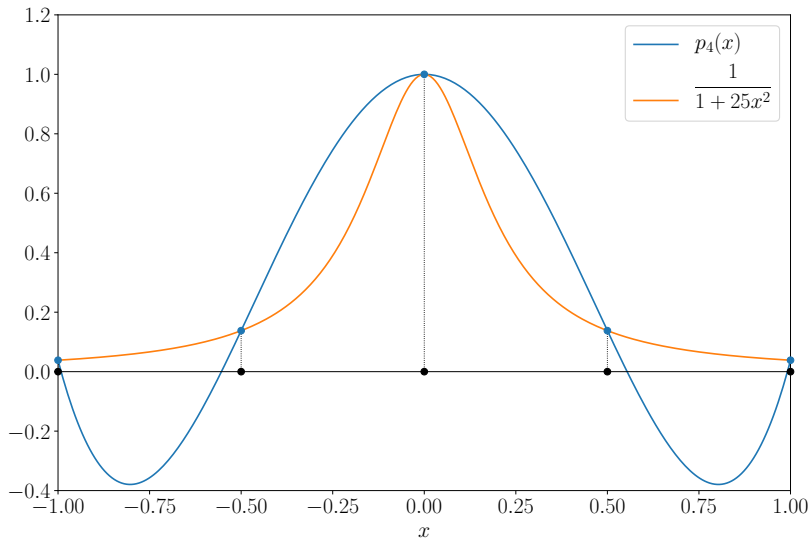
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Fenômeno de Runge



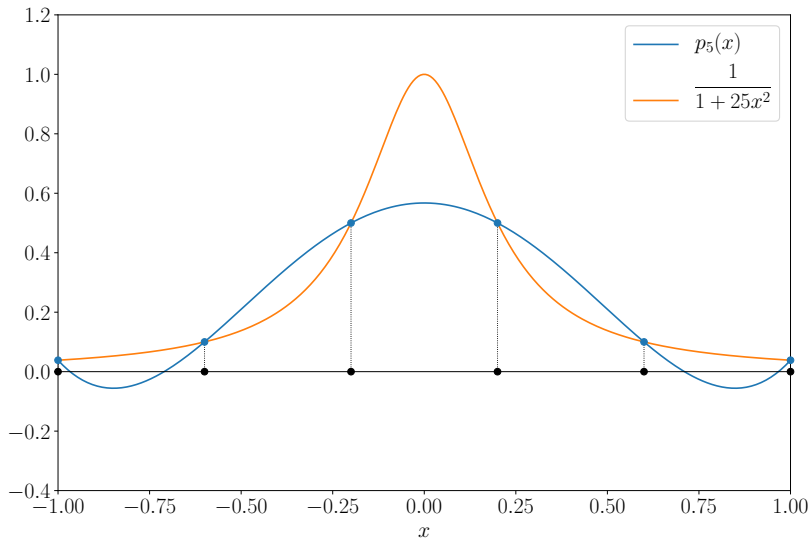
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Fenômeno de Runge



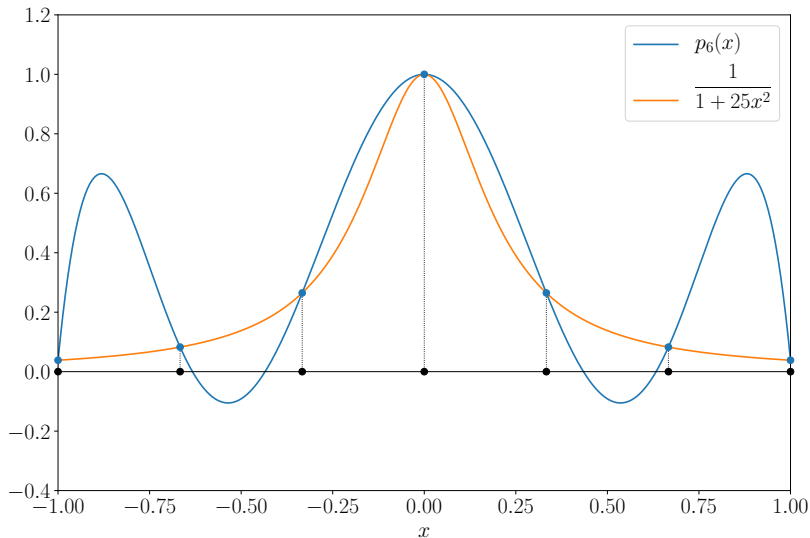
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Fenômeno de Runge



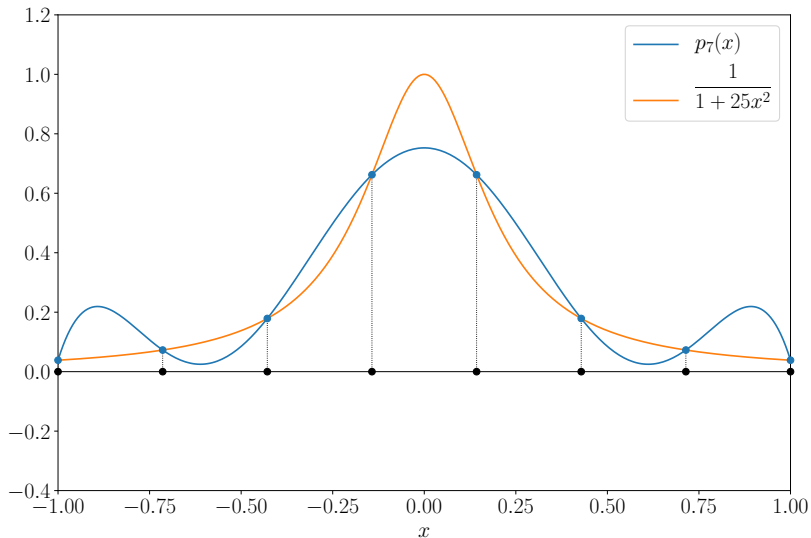
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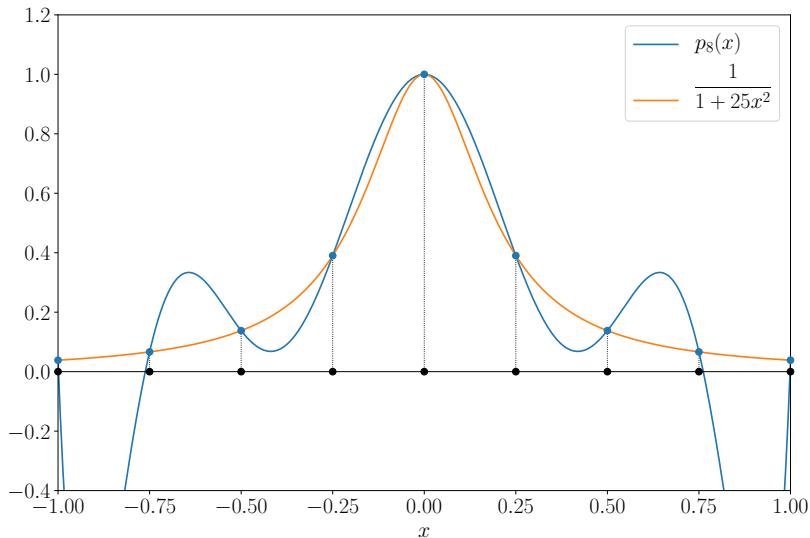
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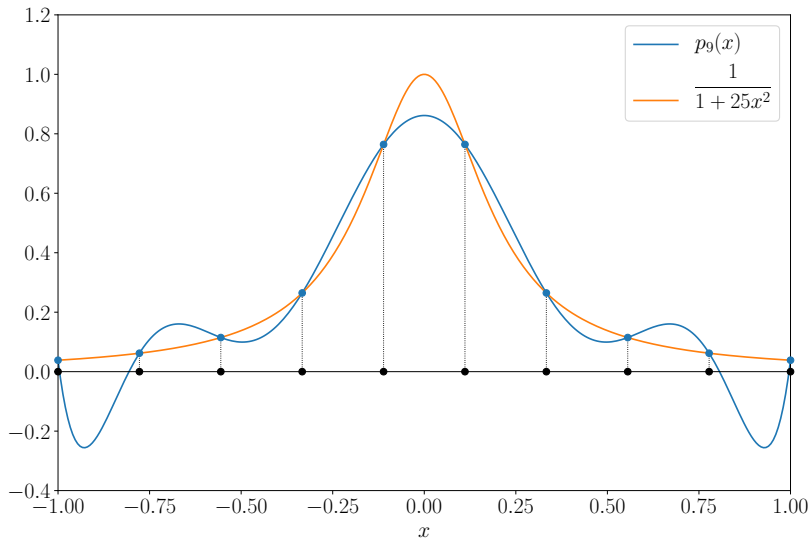
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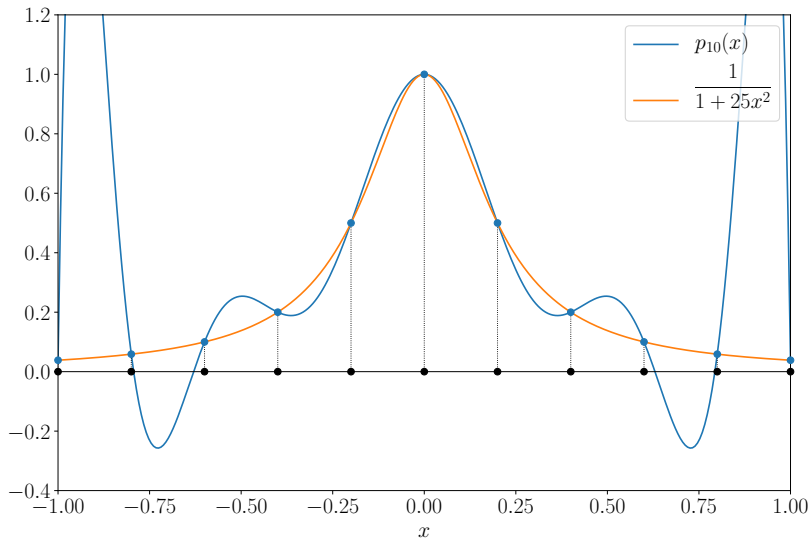
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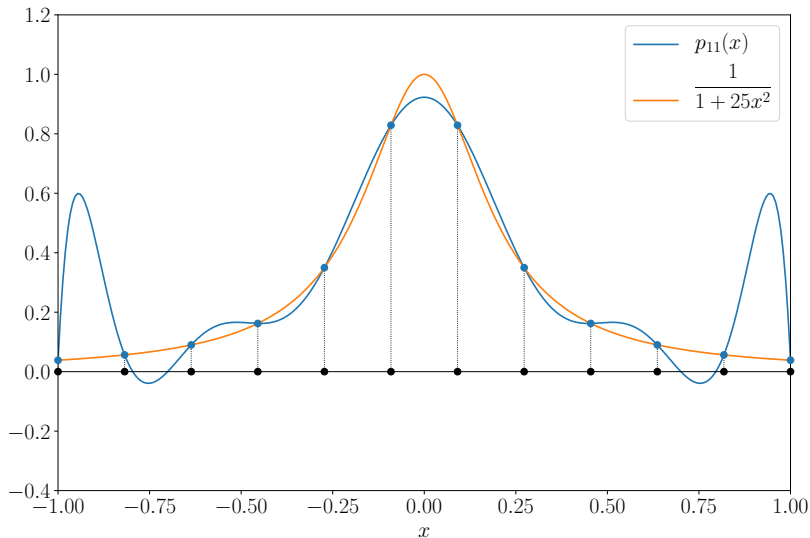
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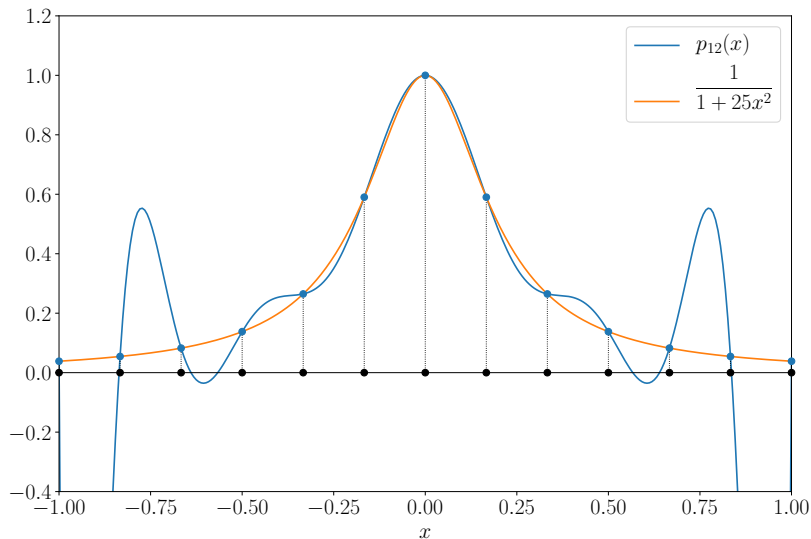
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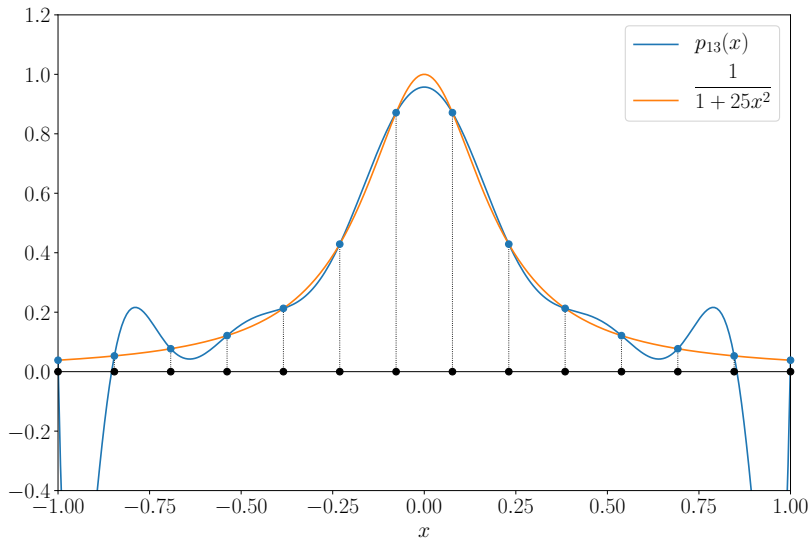
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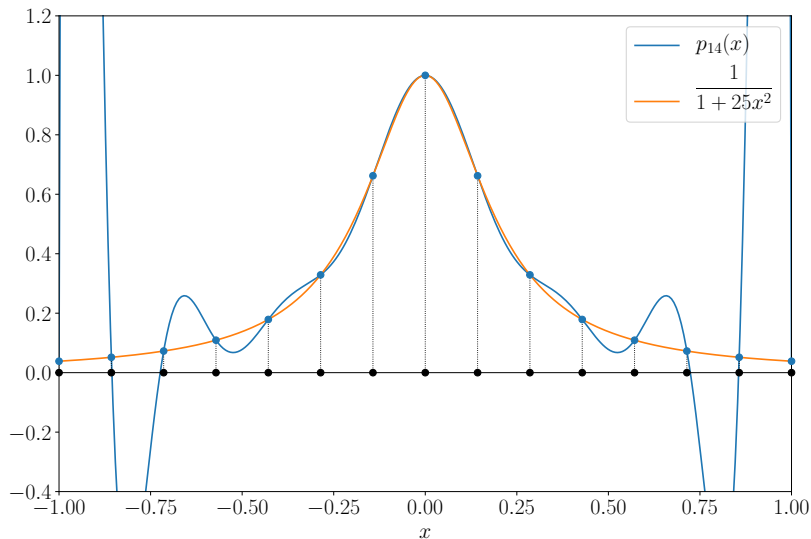
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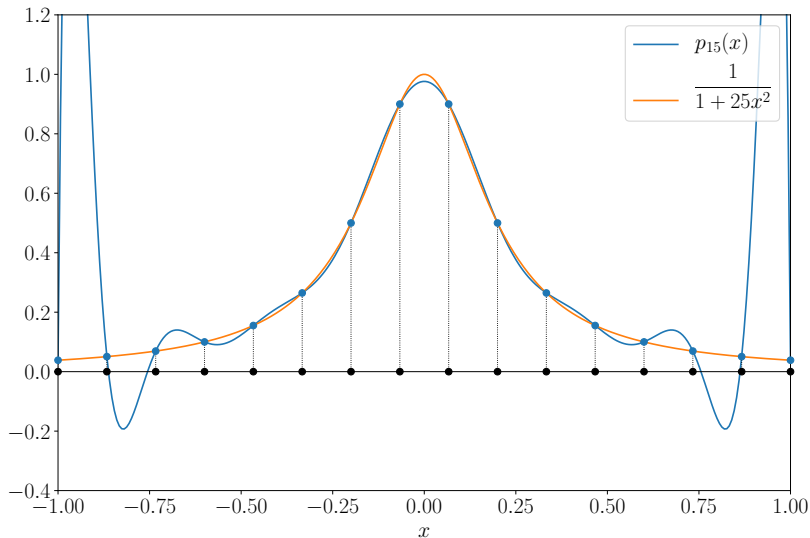
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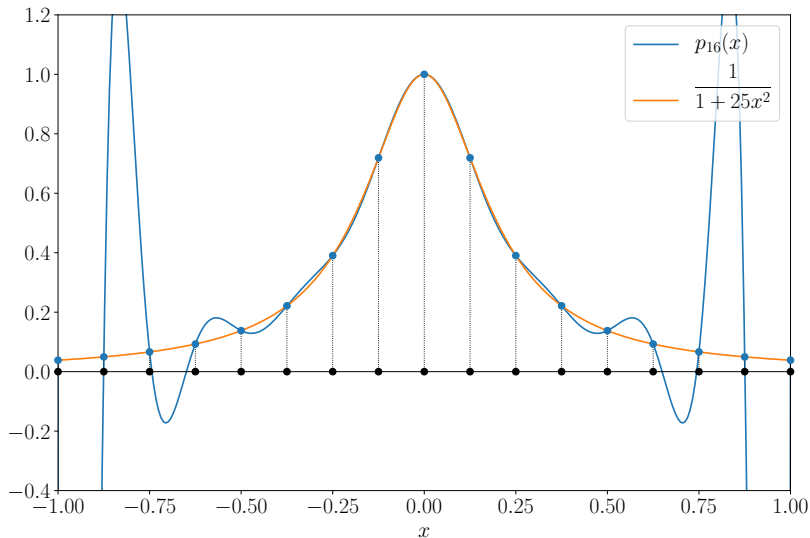
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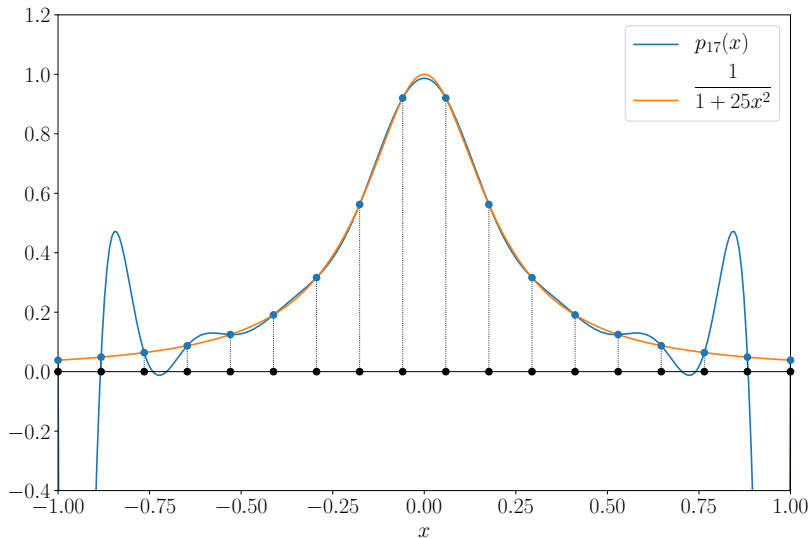
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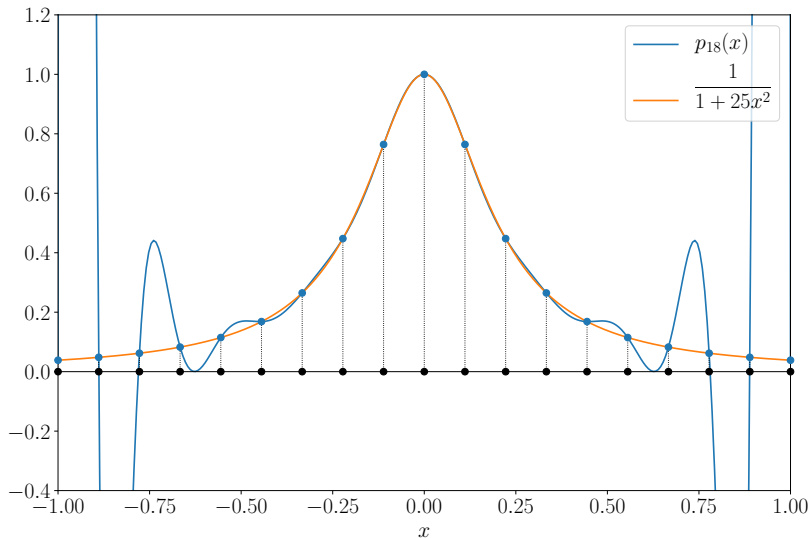
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Fenômeno de Runge



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Fenômeno de Runge

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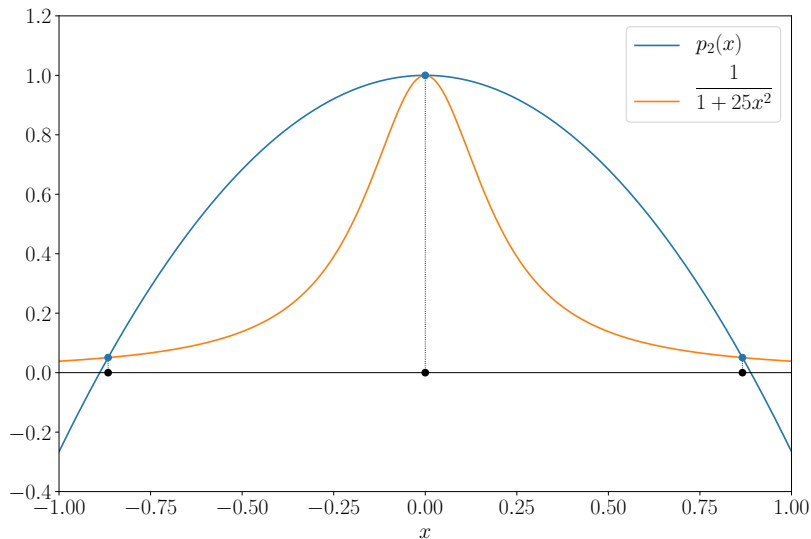
Interpolação Polinomial

Nós de Chebyshev

$$x_i = \cos \left(\frac{2(i+1) - 1}{2(n+1)} \pi \right) \quad i \in \{0, 1, \dots, n\}.$$

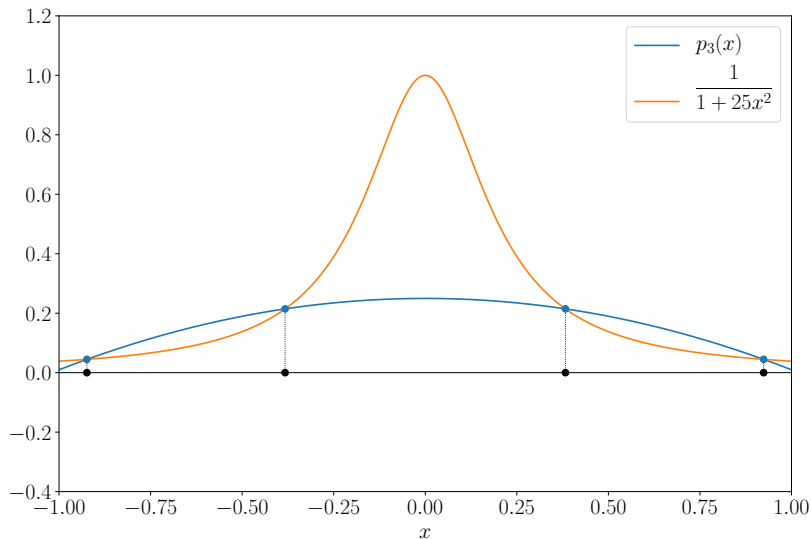
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Nós de Chebyshev



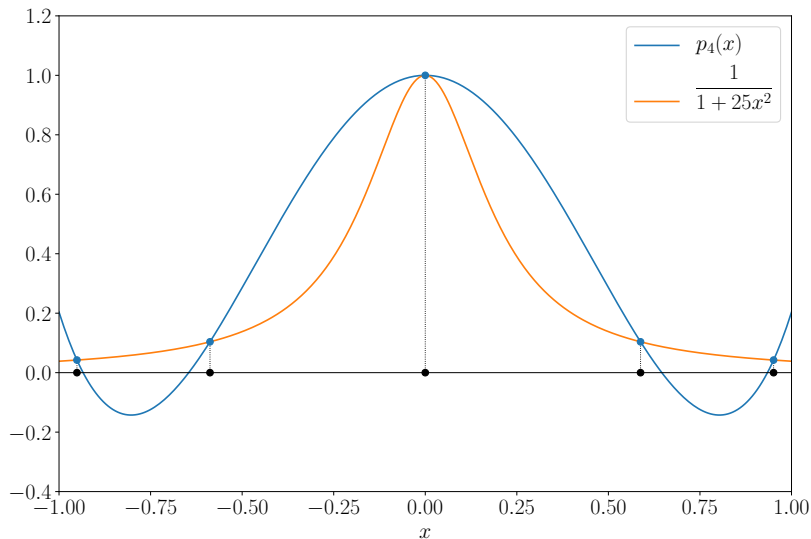
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Nós de Chebyshev



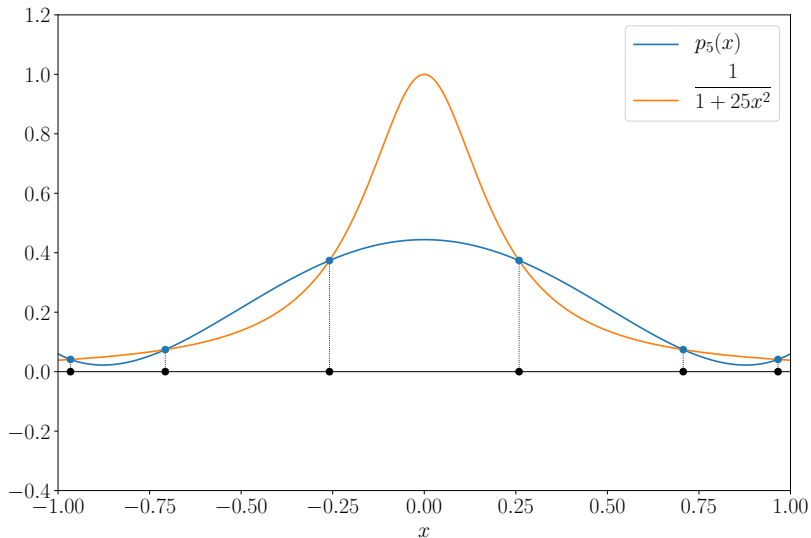
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Nós de Chebyshev



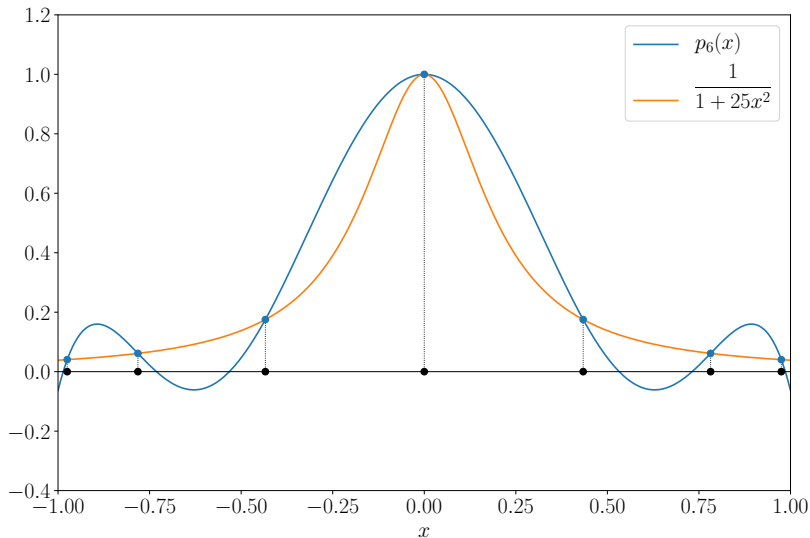
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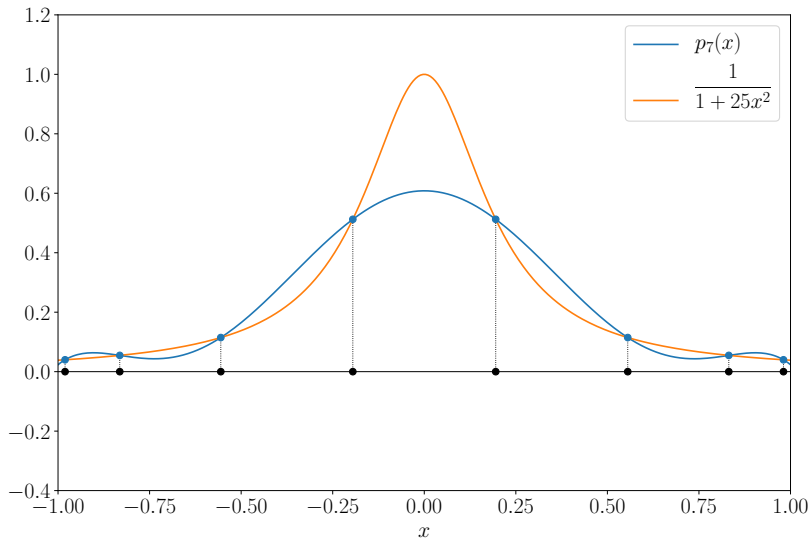
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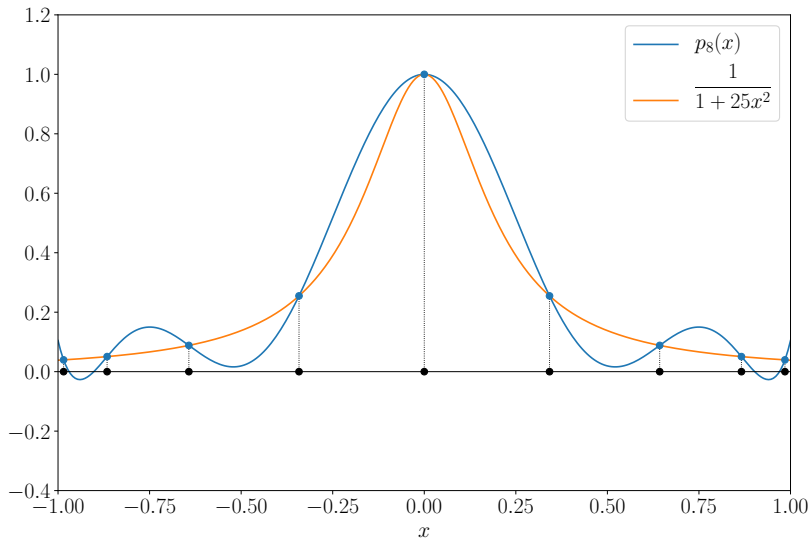
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Nós de Chebyshev



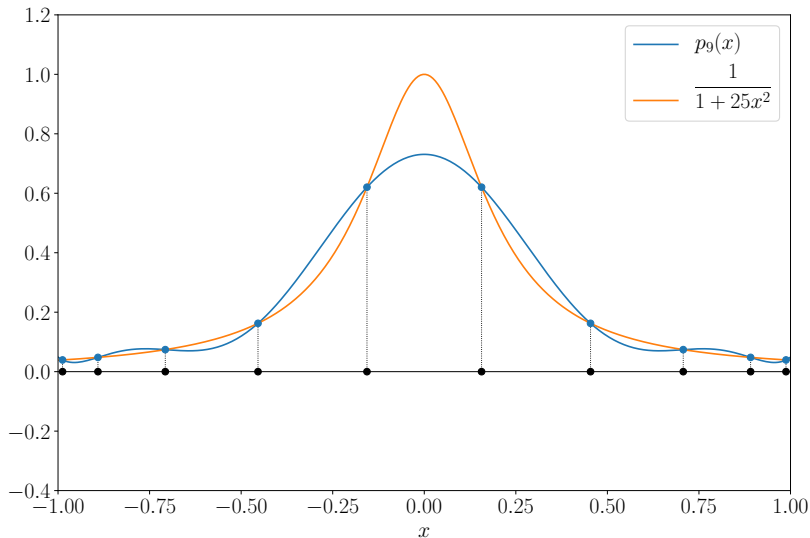
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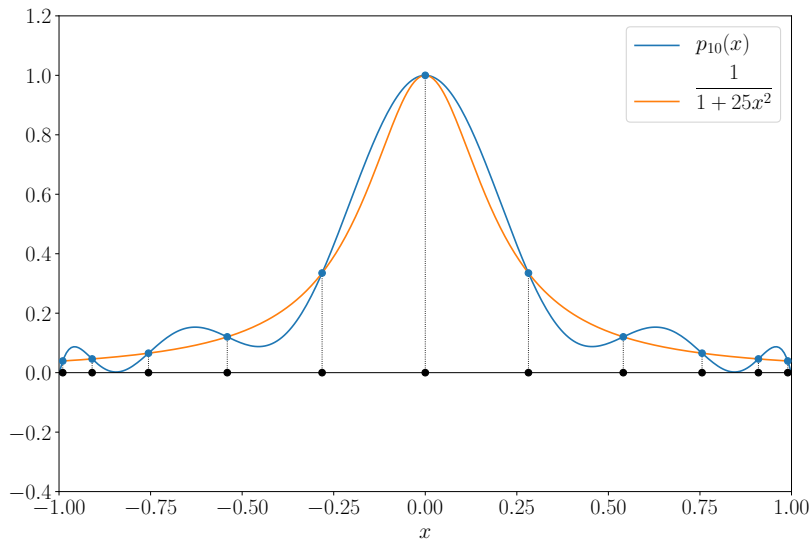
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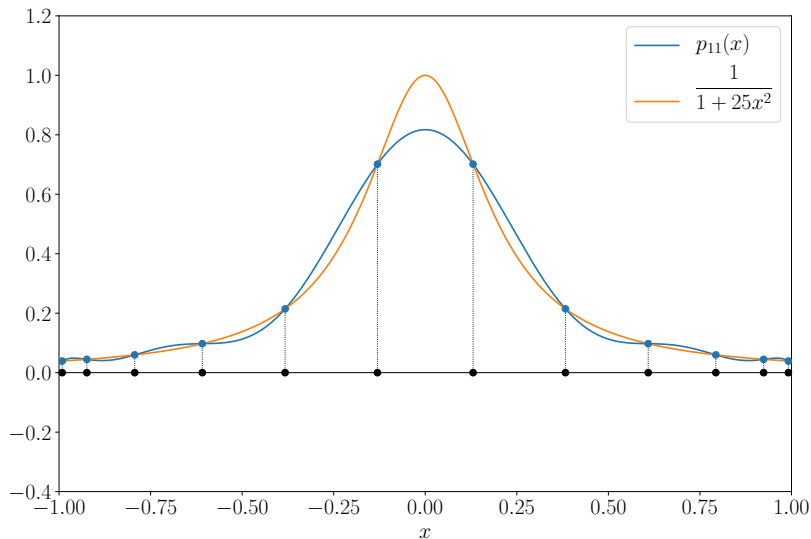
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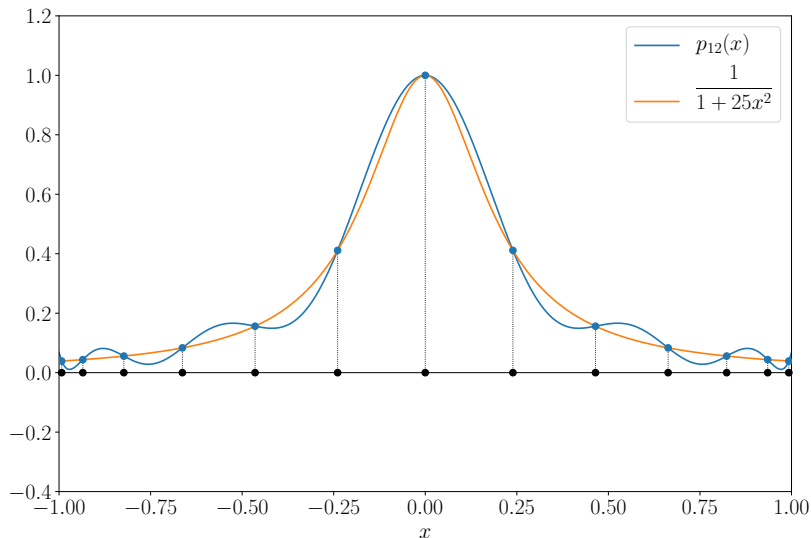
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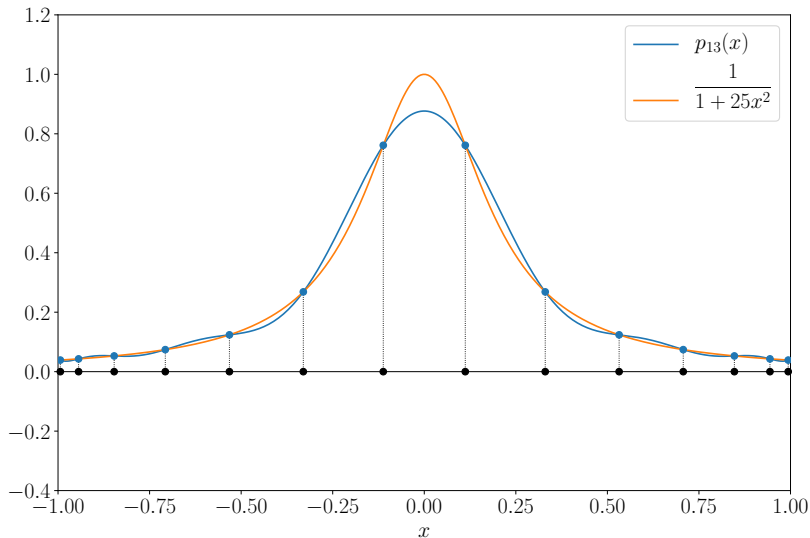
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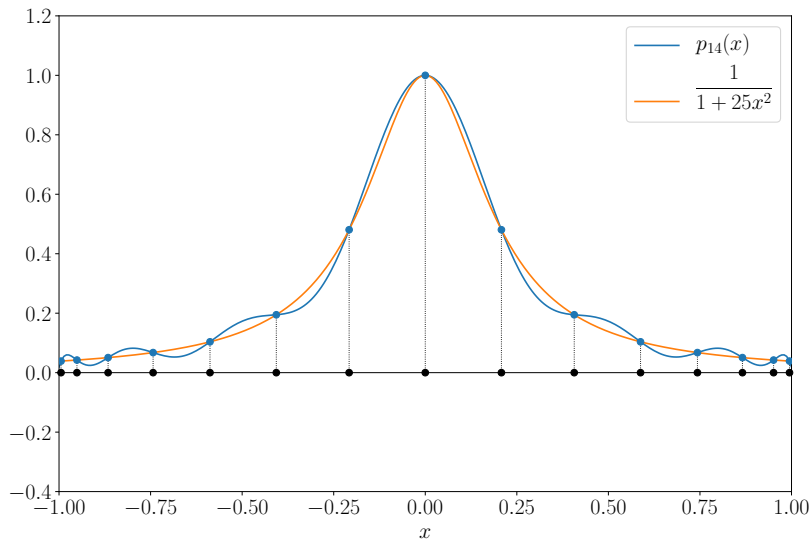
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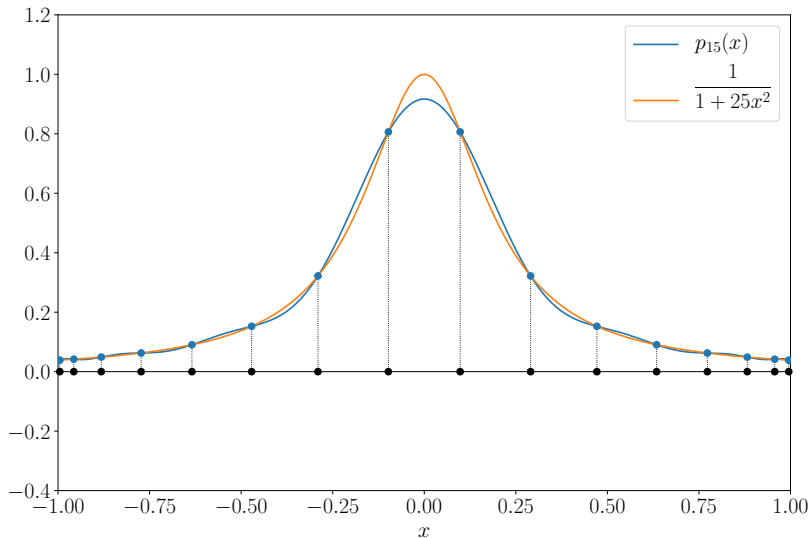
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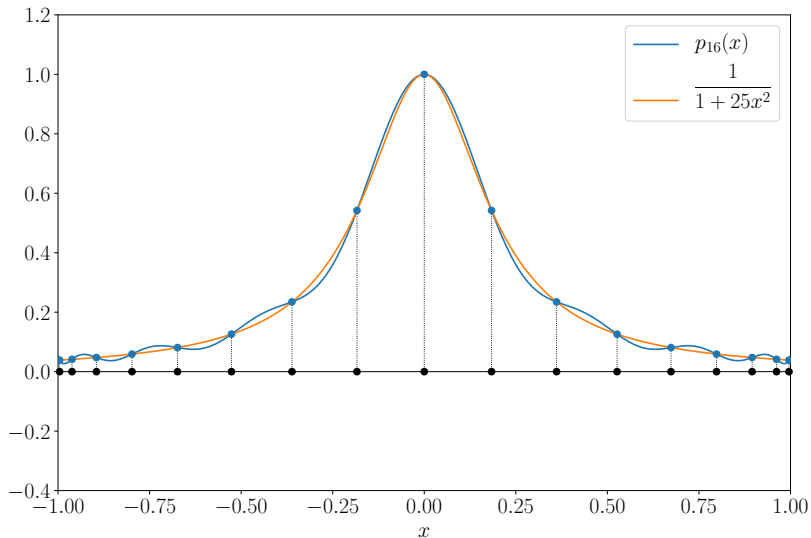
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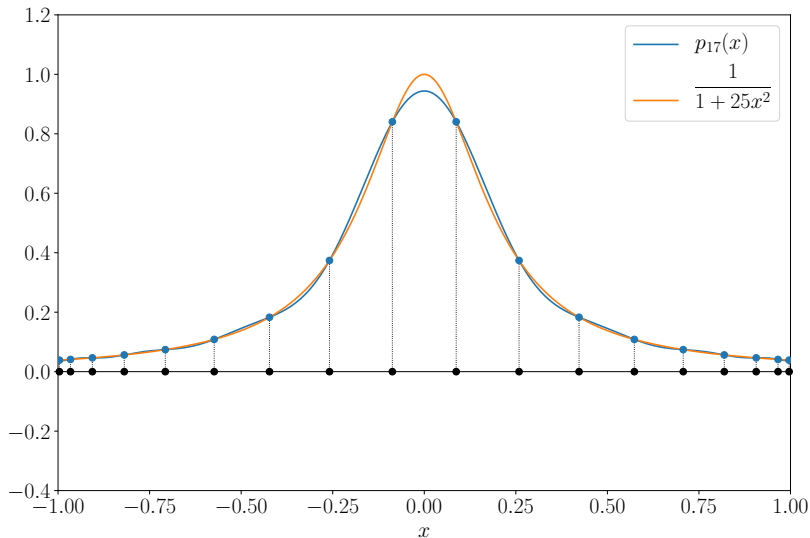
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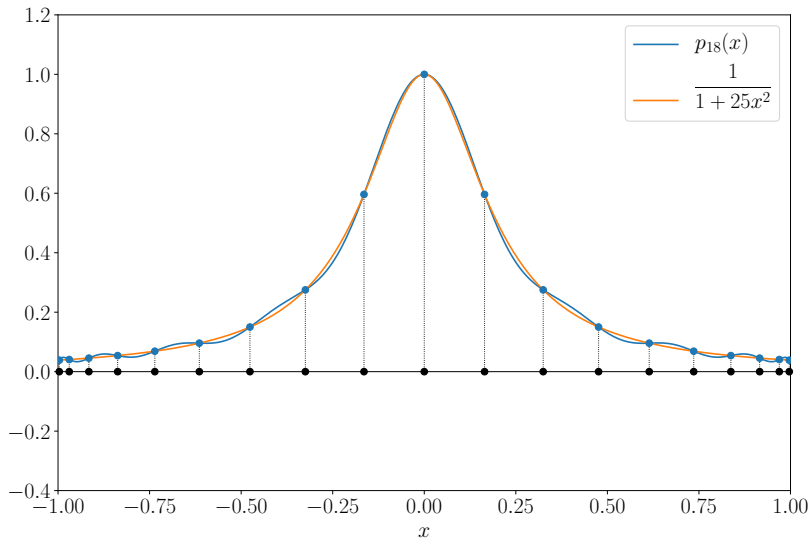
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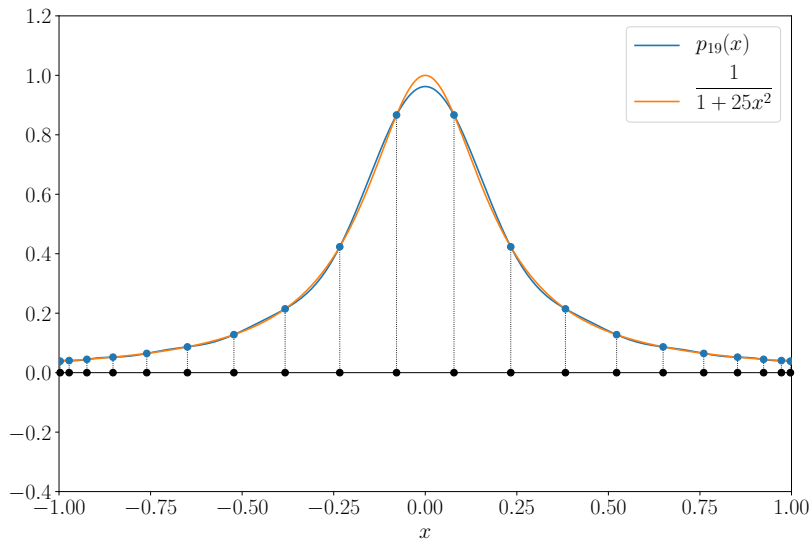
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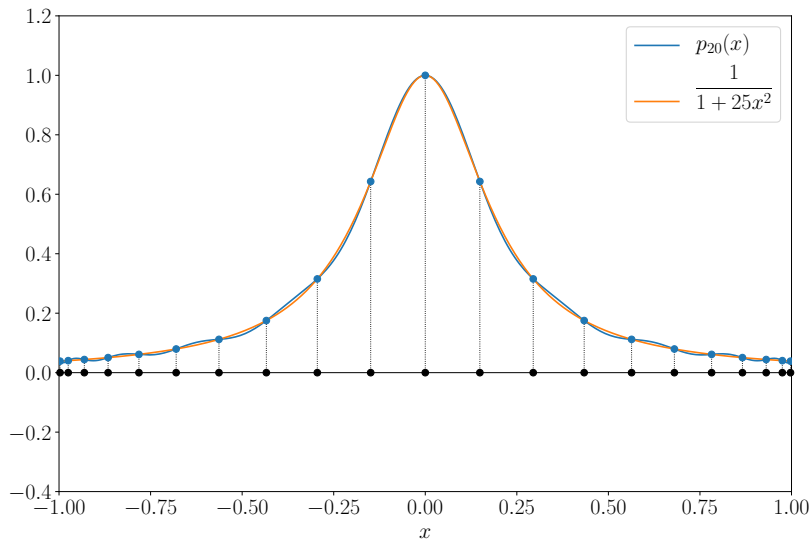
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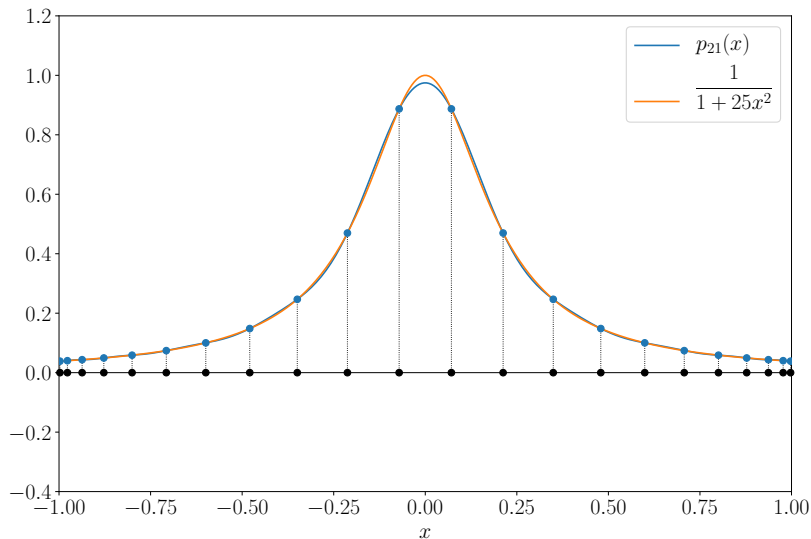
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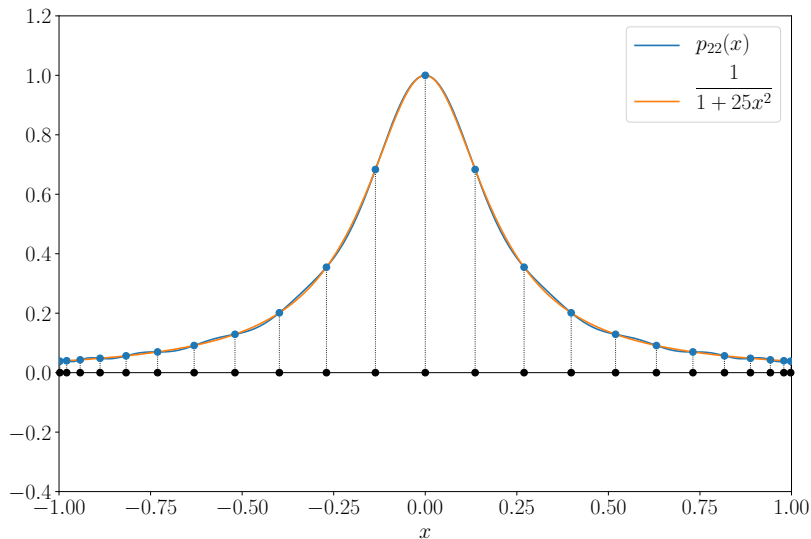
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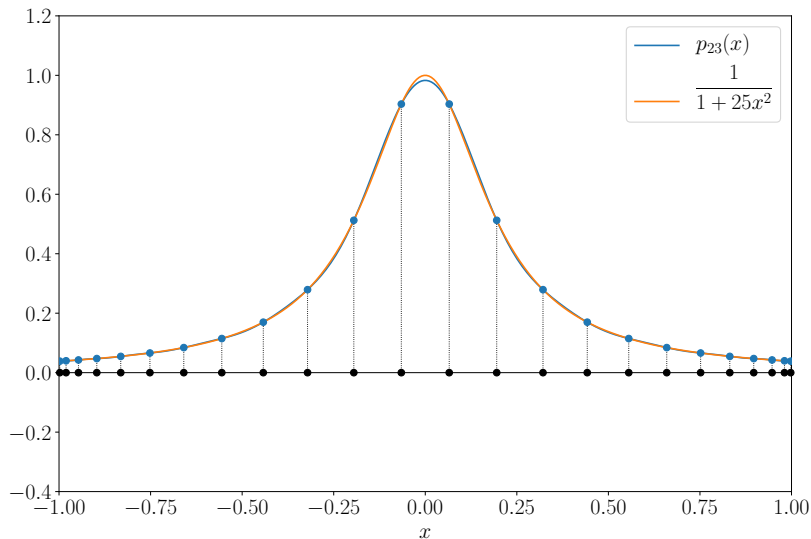
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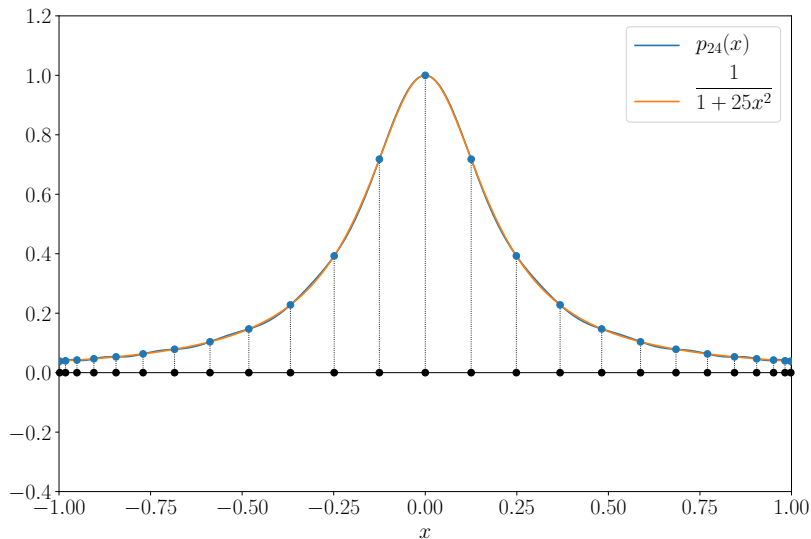
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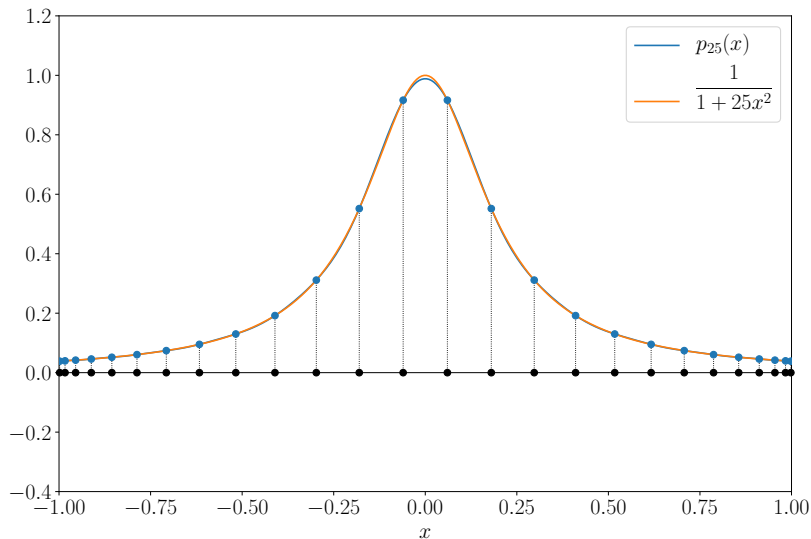
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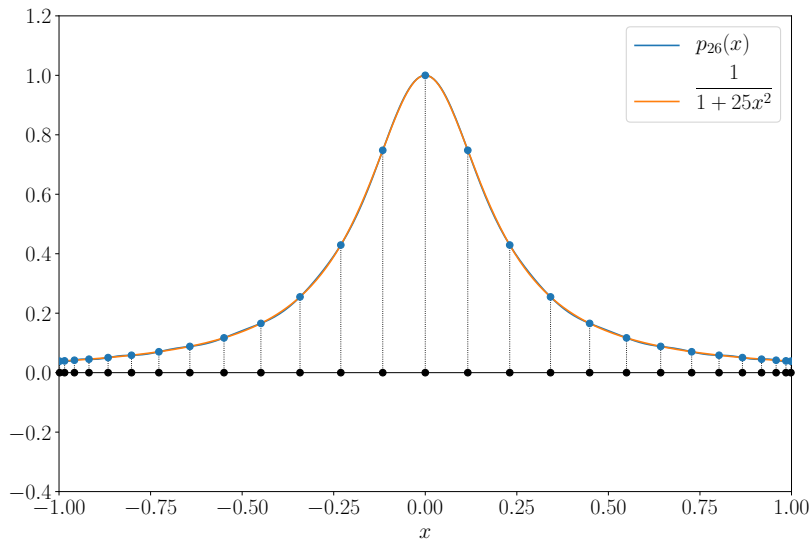
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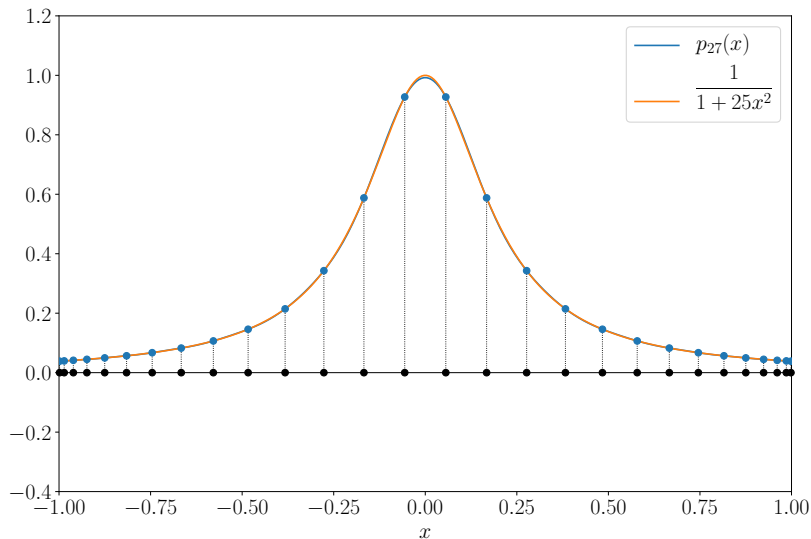
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