Analytical Approximations

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Analytical Approximation

Bessel Function of Imaginary Argument: To better than .0005 over (1, \infty),

\[ e^{-xI_1(x)} \approx \frac{x}{\sqrt{5.3 + 7.7x + 3.9x^2 + 2.7x^3}}. \]

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Bessel Function of Imaginary Argument: To better than .00006 over $(2, \infty)$,

\[ e^{-xT_1(x)} \approx \frac{x}{\sqrt{10.69 + 3.32x + 4.68x^2 + 2\pi x^3}}. \]

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Bessel Function of Imaginary Argument: To better
than .000,008 over (4,∞),

\[ e^{-xI_1(x)} \approx \frac{x}{\sqrt{10.86 + 2.82x + 4.78x^2 + 2\pi x^3}}. \]

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Bessel Function of Imaginary Argument: To better than .0006 over \((0, \infty)\),

\[
e^{-xI_0(x)} \approx \frac{1 + .297x + .341x^2}{1 + 2.333x + 2.137x^2 + 2.096x^3}
\]

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Bessel Function of Imaginary Argument: To better than .00016 over \((2, \infty)\),

\[
e^{-x} I_0(x) = \frac{1}{\sqrt{2\pi x}} \left[ 1 + \frac{120}{x} + \frac{136}{x^2} \right].
\]

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