ANALYTICAL APPROXIMATIONS

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Analytical Approximation

Chi-Square Integral: To better than .00006 over

$0 \leq x \leq 3$ for $m = 3$,

$$F_m(x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^x \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq .26509x^{3/2} - .077320x^{5/2} + .011875x^{7/2} - .00084911x^{9/2}.$$

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Analytical Approximation

Chi-Square Integral: To better than .0000~~14~~10 over $0 \le x \le 2$ for $m = 2$,

$$F_m(x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^x \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq .49977x - .12394x^2 + .019234x^3 - .0015958x^4.$$

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10-9-54

Analytical Approximation

Chi-Square Integral: To better than .0018 over

$0 \le x \le 4$ for $m = 4$,

$$F_m(x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)}\int_0^x \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq .1161x^2 - .03001x^3 + .002568x^4.$$

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Analytical Approximation

Chi-Square Integral: To better than .0009 over $0 \leq x \leq 3$ for $m = 3$,

$$F_m(x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^x \left(\frac{t}{2}\right)^{\frac{m}{2} - 1} e^{-\frac{t}{2}} dt$$

$$\doteq .2589x^{3/2} - .0668x^{5/2} + .00651x^{7/2}.$$

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10-12-54

Analytical Approximation

Chi-Square Integral: To better than .00035 over $0 \leq x \leq 2$ for $m = 2$,

$$F_m(x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^x \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq .4972x - .1163x^2 + .01287x^3.$$

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