

Sample 1. Compare Fortran's built-in gamma function to FM's

Maximum relative error in Fortran gamma was 8.2997390E-16 for $a = 130.500$

$5.666356440039995+218 = \text{gamma}(a)$

$5.666356440039991+218 = \text{gamma}(\text{to_fm}(a))$

Sample 2. Binomial coefficients

Find the probability of getting exactly 10,000 heads
in 20,000 tosses of a fair coin.

$\text{binomial}(\text{to_fm}(20000), \text{to_fm}(10000)) / \text{to_fm}(2)**20000 = 0.0056418253122204$

Sample 3. Log integral

Estimate the number of primes less than 10^{30} .

$\text{log_integral}(\text{to_fm}('1.0e+30')) = 1.469239889772045E+28$

Sample 4. Psi and polygamma functions.

Sum (n=1 to infinity) $1/(n^2 * (8n+1)^2) =$

$16*(\text{psi}(1) - \text{psi}(9/8)) + \text{polygamma}(1, 1) + \text{polygamma}(1, 9/8)$

Sum = 0.0134994861454130

Sample 5. Incomplete gamma and gamma functions.

Probability = 0.1937331301148714