Math 605-01 (172) Homework #2

1) Approximate $\gamma(5, 2.3)$ using the asymptotic expansion

$$\gamma(a,x) \sim \Gamma(a) - x^a e^{-x} \left(\frac{1}{x} + \frac{a-1}{x^2} + \frac{(a-1)(a-2)}{x^3} + \cdots + \frac{(a-1)(a-2)\cdots(a-N+1)}{x^N} \right)$$

,$x \to \infty$ and compute the true value of the incomplete gamma function

$$\gamma(a,x) = \int_0^x e^{-t} t^{a-1} dt$$

and compare the results.