1. Let $I = \displaystyle\int_1^\infty \frac{1}{x^5 + 3x}\, dx$

   (a) Show that I converges.

   (b) Find a definite integral I_1 that will approximate I within 0.002 of its true value.

   (c) Approximate I_1 within 0.002 of its actual value.

   (d) Explain how you have approximated I within 0.004 of its actual value.

2. Find the exact value of $\displaystyle\int_1^\infty e^{-x} x\, dx$.