

I. Use series to approximate the value of the following integrals accurate within 0.001.

1. $\int_0^1 \cos(x^3) dx$

2. $\int_0^{1/4} \frac{1}{1+x^4} dx$ Hint: $\frac{1}{1+x^4} = \frac{1}{1-(-x^4)}$

II. You can show that the series

$$\sum_{n=0}^{\infty} \frac{3(2n)!}{(2n+1)(n!)^2 16^n}$$

converges by the Ratio Test.

Calculate S_5, S_{10}, S_{50} . To what value does the series seem to converge?