

Let $I = \int_1^{\infty} \frac{7}{\sin(x)^2 + x^3} dx$.

1. Show that I converges.

2. Find an upper bound for $I_2 = \int_6^{\infty} \frac{7}{\sin(x)^2 + x^3} dx$.

3. Approximate $I_1 = \int_1^6 \frac{7}{\sin(x)^2 + x^3} dx$ using M_{100} .

How close is this approximation to the exact value of I_1 ?

4. How close is your value for M_{100} to the actual value of I ?