

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  $M_{1000}$ .

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

4. How close is your value for  $M_{1000}$  to the actual value of  $I$ ?