Let $I=\int_{1}^{\infty} \frac{7}{\sin (x)^{2}+x^{3}} d x$.

1. Show that $I$ converges.
2. Find an upper bound for $I_{2}=\int_{6}^{\infty} \frac{7}{\sin (x)^{2}+x^{3}} d x$.
3. Approximate $I_{1}=\int_{1}^{6} \frac{7}{\sin (x)^{2}+x^{3}} d x$ 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 $I$ ?

