Let $\mathcal{I} = \displaystyle\int_5^{10} \cos\left(\frac{x^2}{3}\right) + x\ dx$

1. Calculate M_{1000} and T_{1000}.

2. Use Theorem 7.1 to determine how close these are to the actual value of $\mathcal{I}$.

3. Find a value of n so that M_n approximates $\mathcal{I}$ accurate within 0.0001.