MATH 1120	HOMEWORK #1

Use Maple to answer the following questions. **Please turn in a print out of your Maple work — including the requested graphs.**

$$I = \int_0^2 \sin(x^2)\,dx \qquad \text{and} \qquad f(x) = \sin(x^2)$$

1. Plot $f(x)$ where $0 \leq x \leq 2$.
2. Use Maple's "int" and "evalf" commands to approximate I.
3. Make Maple output plots illustrating the following approximations of I:
   (a) L_5
   (b) T_5
   (c) S_{10}
4. Make Maple output the corresponding summations for problem #3's approximations.
5. Finally, make Maple output the corresponding values for problem #3's approximations.
6. Determine the absolute maximum and absolute minimum of $f'(x)$ on the interval $[0, 2]$.
7. Using the error bound given in the textbook (Theorem 3 in 6.2), find n so that $|I - L_n| \leq 0.005$.
8. Using the n you found in the last part, compute L_n and verify that $|I - L_n| \leq 0.005$.
9. Determine the absolute maximum and absolute minimum of $f''(x)$ on the interval $[0, 2]$.
10. Using the error bound given in the textbook (Theorem 3 in 6.2), find n so that $|I - M_n| \leq 0.005$.
11. Using the n you found in the last part, compute M_n and verify that $|I - M_n| \leq 0.005$.