Fall 2012 MATLAB Assignment 6

Work the following problems (NOTE: these are RELATED TO the corresponding page and problem number from Gilat. Do NOT work the problems from the actual Lab Manual, or you will receive NO CREDIT!)

1. **g313x05**: If the block in the picture is on level ground, the force required to move the box is given by $F = \dfrac{\mu m g\sqrt{x^2+h^2}}{x+\mu h}$. If the mass of the block is $m = 18$ kg, $h = 10$ m, $\mu = 0.55$, and $g = 9.81\text{m/s}^2$, determine the distance x when the pulling force is equal to 90 N.

2. **g315x11**: Same questions using the equation and data above instead.

3. **g317x22**: The orbit of Jupiter is elliptical with a major axis of $a = 7.786 \times 10^6$ km and a minor axis of $b = 7.769 \times 10^6$km. The perimeter of an ellipse can be calculated by $P = 4a\displaystyle\int_0^{\pi/2} \sqrt{1-k^2\sin^2\theta}\, d\theta$ where $k = \dfrac{\sqrt{a^2-b^2}}{a}$. Determine the distance Jupiter travels in one orbit. Calculate the average speed at which Jupiter travels (in km/hr) if one orbit takes about 11.86 years.

4. Also work **s644x13** from the Stewart text. Also show your graph of $|f^{(n+1)}(x)|$ to justify your choice of M.