Homework 1 (Posted 16th January, Submit to Ms. Spanner before 10 AM 23rd January)

Problem 1: 20 pts   Consider the following functions:

1. $f_1(x) = 20x^5 + 400x^2$

2. $f_2(x) = \log_2 x + \log_2 \max(1, \log_2 x)$

3. $f_3(x) = x$

4. $f_4(x) = 2^{0.5x-5}$

5. $f_5(x) = 1000x^3$

6. $f_6(x) = 2^{\cos x}$ (here x is in degrees).

Write a program to generate a table of values of $f(x)$ versus x for each of these functions, starting from $x = 1$. Use your tables to plot these functions. The objective is to compare the values of these functions for large x. Choose the upper bound for the range of x in your plot suitably. Order these functions in increasing order for (a)$x = 1$ (b) $x = 4$ (c)$x = 8$ (d)$x = 12$ (e) $x = 16$ (f) $x = 24$ (g) $x = 32$. Is it possible to give an increasing order for these functions for any large value of x (say any x greater than 32)?

Now plot $\frac{f_1(x)}{f_5(x)}$ versus x. Can you say anything about the value of $\frac{f_1(x)}{f_5(x)}$ for large x? Repeat this problem for $\frac{f_2(x)}{f_4(x)}$.