Math 2513
Homework Assignment #1
due Tuesday January 25

Problem 1: For each positive integer n, let C_n be the number of different ways to parenthesize a product

$$x_1 x_2 x_3 \cdots x_{n-1} x_n$$

of n terms so that just two terms are multiplied at a time.

(a) In class we showed that $C_5 = 14$. List the 14 different ways that $x_1 x_2 x_3 x_4 x_5$ can be parenthesized.

(b) Use the recursion formula

$$C_n = C_1 C_{n-1} + C_2 C_{n-2} + C_3 C_{n-3} + \cdots + C_{n-1} C_1,$$

which we discussed in class, to determine the value of C_{10}.

(c) What is the smallest value of n for which C_n exceeds 1 million?

Problem 2: Work problems 2, 4, 6, 8, 12 and 18 on page 85 of the textbook.