

Module 7, Problems (19-21).

19) Consider the expression $1*2*3*4*5*6*7*8*9*10$. Can we exchange all $*$ in this expression to either $+$ or $-$ in the expression **in such a way that the expression will be equal to 0**? [For example replace the $*$ so the expression reads $1+2+3-4+5-6+7-8-9+10$]

20) Let p and q be prime numbers. How many divisors does the number $N = p^8q^5$ have?

21) Suppose we have a standard 8x8 checkerboard. The checkerboard has 64 squares and it is easy to completely cover the checkerboard with 32 2x1 dominoes. Suppose we modify the checkerboard by removing 2 squares-- on the first row, the extreme right square and on the eighth row the extreme left square (see diagram below). Show that the checkerboard cannot be completely covered with 31 dominoes. [hint: the answer is in black and white]

