Homework 9 - Math 574, Frank Thorne (thornef@mailbox.sc.edu)
Due Friday, April 6 at 5:00.

Instructions: Please give numerical answers to all questions, except any involving 11! or higher, in which case you may answer in terms of factorials.

Please do not give bare answers to any question; add a little bit of explanation, although not so much is necessary as to be considered a 'proof'. For most problems, about one sentence will be good.

Core:

9.5: 6, 8, 13, 17, 19, 23, 24(a-b), 26(a-c).

9.6: 7, 13.

(1.) How many ten-bit strings are there?
(2.) How many ten-bit strings are there with exactly four ones?
(3.) A bagel shop sells plain bagels, whole wheat bagels, and blueberry bagels. In how many ways can you buy 12 bagels, if all bagels of a given type are identical?
(4.) A bagel shop sells plain bagels, whole wheat bagels, and blueberry bagels. In how many ways can you buy 12 bagels, if all bagels of a given type are identical, provided that you must buy at least two blueberry bagels?
(5.) A bagel shop sells plain bagels, whole wheat bagels, and blueberry bagels. In how many ways can you buy 12 bagels, if all bagels of a given type are identical, provided that you may not buy more than six bagels of any one type?
(6.) A bagel shop sells plain bagels, whole wheat bagels, and blueberry bagels. In how many ways can you buy 12 bagels, if all bagels of a given type are identical, provided that the bagel shop only has five blueberry bagels remaining?
(7.) For how many integers between 1 and 99,999 is the sum of the digits equal to 10?
(8.) How many solutions are there to the equation $a + b + c + d = 10$, where a, b, c, d are positive integers?
(9.) How many solutions are there to the equation $a+b+c+d = 10$, where a, b, c, d are nonnegative integers?
(10.) How many triples of integers i, j, k are there with $1 \leq i \leq j \leq k \leq 8$?
(11.) How many triples of integers i, j, k are there with $1 < i < j < k < 8$?
(12.) How many triples of integers i, j, k are there with $1 < i < j < k < 11$?
(13.) How many triples of integers i, j, k are there with $1 < i \leq j < k \leq 11$?

Additional:

9.5: 7, 9, 14, 15, 20, 21, 22, 24(c-d), 25, 26(d-e). 9.6, 14.

Bonus: (2 points each) 9.6: 17, 37.