

Assignment 8, Math 240, Fall 2005

Due: 2:45pm, October 11. Value: 30 pts.

On all questions, here and elsewhere, you can feel free to express answers as a simple expression without writing down the specific number; for example, if the answer is $2^{100} - C(100, 3)$, you can write that rather than attempt to compute the number. However, your answer should always be as simple as possible, and it should always involve only well-known mathematical functions.

In all cases, you should justify your answer: Never write just a number or an expression. Without a justification, I will give you zero credit, even if the answer is correct.

Based on September 29 material (§4.1)

Problem A. How many strings of n bits are there where every 1 bit is followed by a 0 bit?

Problem B. How many strings of 10 bits have either 0 bits in the first, third, fifth, seventh, and ninth places, or 0 bits in the first, fourth, seventh, and tenth places.

Problem C. Suppose we have a set of six tiles labeled as listed below. How many different six-letter strings can be formed using the tiles?

- a. O,H,D,E,A,R.
- b. O,H,D,E,E,R. (Hint: Think about the list of all possible orderings, and think about how often an ordering is a duplicate of another.)

Based on October 4 material (§4.2)

Problem D. §4.2 (p 319): 8.

Problem E. §4.2 (p 319): 32.

Problem F. §4.2 (p 319): 36. Knowing is mutual; that is, if I know somebody, then that person also knows me.

Based on October 6 material (§4.3)

Problem G. How many strictly increasing sequences of three integers between 1 and 100 (inclusive) are there?

Problem H. §4.3 (p 325): 26abc. In parts a and c, “take the field” means that we don’t care which positions the individual players take.