

Math 213 - Homework 11

Assigned: 10/31/07

Due: 11/7/07 at the start of class.

Notation: Exercise a.b.c(d) stands for part (d) of Exercise c from Section a.b.

Problems:

- (1) 8.1.4(b).
- (2) 8.1.38(b).
- (3) 8.3.14(d).
- (4) 8.3.24.
- (5) 8.5.6.
- (6) Let A and B be sets and suppose that R_1 and R_2 are equivalence relations on them. Let R be the relation on $A \times B$ given by saying that $(a, b)R(c, d)$ if aR_1c and bR_2d . Show that R is an equivalence relation.
- (7) 8.5.44(a).
- (8) 8.5.44(b).
- (9) 8.5.68.
- (10) (For section X1) Suppose that $N = 14661709$ is a product of two primes. Given that $\phi(N) = 14653116$, find the primes. (Feel free to use a calculator). (For section G1) Suppose that $S = \{1, 2, 3, \dots, 10\}$. Three distinct elements are chosen at random from S (and all of the $10 \cdot 9 \cdot 8$ options are equally likely). You are shown these three entries one at a time and when you see an option you must decide once and for all whether to take it or not. Suppose your strategy is to pick the first number that is 7 or greater, or the last number if all were less than 7. Show that the probability that you take the largest number is $516/720$.