

CmpE 220
Homework #2 (due Friday, November 5th 16:00)

October 26, 2004

- No collaboration
- Your answers should be your own work
- Cheaters will get an F from this course
- Submit your homework before the PS. Late submissions will not be graded.

1. Suppose A and B are sets such that $s(A)$ is infinite and $s(B)$ is finite. $f : A \rightarrow B$ is a function. Prove that for at least one $b \in B$, the set $f^{-1}(b) = \{x \in A \mid f(x) = b\}$ is infinite.
2. Prove that every integer greater than 27 can be written as $5a+8b$ where $a, b \in \mathbb{Z}^+$
3. (a) Find a recurrence relation for the number of permutations of a set with n elements.
(b) Use this recurrence relation to find the number of permutations of a set with n elements using iteration.
4. Let a be an integer. Prove that if a^2 is even, then a is even.