

Math 220 – Homework 5 (HNR)

Due Thursday 10/04 at the beginning of class

Total points: 142 (Problems marked by * will count toward writing portion.)

PART A*

Problems from the textbook:

problem	4.10	5.10	5.14	5.26	5.28	5.34	5.36	5.38
points	10	10	10	10	10	15	10	10

Hint for the problem 5.26: Use proposition 32 from your notes.

PART B

- * [10 points] Prove that there are no integers m and n such that $m^2 = 4n + 3$.
- * Let n be an integer.
 - [10 points] Prove that n is even if and only if n^3 is even.
 - [2 points] Prove that n is odd if and only if n^3 is odd.
 - [10 points] Prove that $\sqrt[3]{2}$ is irrational.
- (a) * [10 points] Let $n \in \mathbb{Z}$. Prove that if $2|(n^2 - 5)$, then $4|(n^2 - 5)$.
 (b) [5 points] Give an example of an integer n such that $2|(n^2 - 5)$, but $8 \nmid (n^2 - 5)$
- Consider the statement:

“If the product of two integers is even, then at least one of these integers is even.”

 - [2 points] Rewrite the statement in symbols.
 - * [8 points] Give a formal proof.