Math 417: Homework 2

Due Friday, September 8, 2023

1. Goodman, exercise 1.6.1. The "well-ordering principle" is the statement that *any nonempty set of nonnegative integers has a least element.*

2. Goodman, exercise 1.6.2.

3. Goodman, exercise 1.6.3.

4. Goodman, exercise 1.6.4.

5. Goodman, exercise 1.6.7.

6. Goodman, exercise 1.6.8.

7. For each of the following equations, either find a pair of integers (x, y) that makes the equation true, or show that no such pair exists.

   (a) $64x + 76y = 1$.

   (b) $64x + 76y = 2$.

   (c) $64x + 76y = 4$.

   (d) $64x + 76y = 8$.

8. In the lecture notes it was shown that if a prime number p divides a product ab of two nonzero integers, then p divides one of the factors. Using that statement, show that if a prime number p divides a product $a_1 a_2 \cdots a_r$ of several nonzero integers, then it divides one of the factors.