MATH 300. INTRODUCTION TO MATHEMATICAL REASONING.
FALL 2015.
WEEK 10 (LECTURE 18-19).
PEANO’S AXIOMS. METHOD OF MATHEMATICAL INDUCTION.

1. Reading: Section 2.4 and Lecture Notes.
2. Home assignment (Due Monday, November 9) (to submit).
   Problems at Sect.2.4: 5(a,b), 6(d,e,g,) 7(a,c,d,g,,j,l).
   Extra problems:
   1. Show that any amount of postage that is an integer number of cents greater than 11 cents can be formed using just 4-cent and 5-cent stamps. (Prove by induction).
   2. Explain what is wrong with the following proof by mathematical induction that all horses have the same color. It’s true for the set of 1 horse (basic step). Now assume that all horses in any set of \( k \) horses are the same color. Consider a set of \( k + 1 \) horses, labeled with the integers 1, 2, 3, ..., \( k + 1 \). By the induction hypothesis, horses 1, 2, ...\( k \) are all the same color, as are the horses 2, 3, 4, ..., \( k + 1 \). Because these two sets of horses have common members, all \( k + 1 \) horses must be the same color. This completes the proof.