

Name: _____

Math 203: Contemporary Mathematics

Quiz 2: Tuesday, January 20, 2009

The following two questions are worth up to 3 bonus points each. These points will be based on the accuracy, completeness, and clarity of your responses. Use full sentences, and avoid saying things that are untrue, ambiguous, or nonsensical. You may use your book or any notes that you have.

1. According to the textbook, a *binary code* is “a data coding system made up of two states or symbols.” Give at least three examples of binary codes and describe the “two states or symbols” used in each.

2. [Section 1.1, problem 10(c).] Suppose you create a seven-digit identification number so that the seventh digit is the check digit. The check digit is the remainder when a weighted sum of the first six digits is divided by 7. The weighted sum is formed by multiplying each of the first six digits by the digit’s position. Thus,

$$\text{the weighted sum} = 1d_1 + 2d_2 + 3d_3 + 4d_4 + 5d_5 + 6d_6.$$

For example, if the first six digits of an identification number are 208455, then the weighted sum is

$$1(2) + 2(0) + 3(8) + 4(4) + 5(5) + 6(5) = 2 + 0 + 24 + 16 + 25 + 30 = 97.$$

When this weighted sum is divided by 7, the remainder is 6. The complete identification number is 2084556.

The first six digits of an identification number are 446091. Calculate the check digit.