

# Homework #1

Last Name: \_\_\_\_\_

Name : \_\_\_\_\_

PSID: \_\_\_\_\_

**TRANSITION TO ADVANCED MATHEMATICS  
HOMEWORK#1 – DUE THURSDAY, 02/01**

*Problem 1.* Write plain English negations (besides just putting a not in the sentence) of the following propositions:

- (a) There are exactly 10 composite numbers less than 20.
- (b) Humans will be extinct by January 1, 2052.
- (c) Cleveland lost the first two games.

*Problem 2.* Exercise 1.1 Problem 2 (b),(c),(d),(i).

*Problem 3.* Exercise 1.1 Problem 3 (d),(e),(g).

*Problem 4.* Exercise 1.1 Problem 4 (b),(d),(f).

*Problem 5.* Exercise 1.1 Problem 6 (f),(g).

*Problem 6.* Exercise 1.1 Problem 9 (a),(c),(f).

*Problem 7.* Exercise 1.1 Problem 11 (a),(b),(c),(e),(f).

*Problem 8.* On an island, the populace is of two kinds: knights and knaves. Knights always tell the truth, knaves always lie.

- a. An islander - call him A - made a statement about himself and a friend, call him B:  
"At least one of us is a knave." What are A and B?
- b. A says: "B is a knave if and only if I am a knave"  
B says: "We are of different kind". What are A and B?

Hint: Write out a truth table justifying your reasoning and clearly explain why you came to the conclusion that you did.

*Problem 9.* Exercise 1.2 Problem 3.

*Problem 10.* Exercise 1.2 Problem 7 (a),(d).

*Problem 11.* Exercise 1.2 Problem 9 (a),(b),(d),(e).

*Problem 12.* Exercise 1.2 Problem 10 (b),(f),(i).