

MATH 108—HOMEWORK 01

Due: Tuesday January 31

NAME _____

Directions: please print this page, and put your solutions in the space provided.

1. Let p and q be the propositions

p : It is below freezing.
 q : It is snowing.

Write the following propositions using p and q and logical connectives.

- (a) It is not below freezing, and it is not snowing.
- (b) It is below freezing but not snowing.
- (c) If it is below freezing, it is also snowing.
- (d) It is either below freezing or it is snowing, but it is not snowing if it is below freezing.

2. Let p , q , and r be the propositions

p : You get an A on the final exam.
 q : You do every exercise in the textbook.
 r : You get an A in the class.

Write the following propositions using p , q , and r and logical connectives.

- (a) To get an A in the class, it is necessary for you to get an A on the final.
- (b) You get an A on the final, but you don't do every exercise in this book; nevertheless, you get an A in the class.
- (c) Getting an A on the final and doing every exercise in this book is sufficient for getting an A in the class.
- (d) You will get an A in the class if and only if you either do every exercise in this book or you get an A on the final exam.

3. Write each of the following statements in the form “if p , then q ” in English.

(a) The beach erodes whenever there is a storm.

(b) I will remember to send you the address only if you send me an e-mail message.

(c) To be a citizen of this country, it is sufficient that you were born in the United States.

(d) It is necessary to have a valid password to log on to the server.

4. State the converse and contrapositive of each of the following implications.

(a) A positive integer is a prime only if it has no divisors other than 1 and itself.

Converse:

Contrapositive:

(b) I go to the beach whenever it is a sunny summer day.

Converse:

Contrapositive: