QUIZ 4 - MATH 2000 February 12, 2009 Time: 10 minutes

LAST NAME:

FIRST NAME:

## Question 1

For statements P, Q, and R, list the 8 fundamental logical equivalences. There are 2 commutative laws, 2 associative laws, 2 distributive laws, and 2 De Morgan's laws.

## Question 2

Consider the following quantified statement:

P: 'There exist rational numbers x and y such that  $x-y \leq -7$  and xy > 21.'

(i) Using quantifiers express in symbols the quantified statement P.

(ii) Express in words the negation of this quantified statement.

(iii) Using quantifiers express in symbols the negation of the quantified statement P.