MAD 2104: Practice Test 1

"Given any two real numbers, there is a real number in between."

4 real numbers a and B, 3 a real number c s.t.

2. Let $A=\{c, d, f, g\}$, $B=\{f, j\}$, and $C=\{d, g\}$. Answer yes or no for the following questions:

accep.

a. Is $B \subseteq A$? N() b. Is $C \subseteq A$? YES c. Is C a proper subset of A? YES (A COntains etts, not in C)

3. Consider the statement forms $(p \lor q) \lor (p \land r)$ and $(p \lor q) \land r$. Fill in the truth table showing each form:

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Are they logically equivalent? N0

4. Use De Morgan's law to write the negation of: x < 2 or x > 5.

X \$ 2 and X \$ 5 ,000

X 3.2 and \times 55 or 25 \times 5. Write the negation of: "If today is New Year's Eve then tomorrow is January."

Today is New Year's Eve and tomorrow

6. For the statement "If the decimal expansion of r is terminating then r is rational", give the

a. Inverse

if the decimal expansion of ris not terminating, then ris not rational.

If r is not rational, then the decimal expansion of r is not terminating.

7. Construct a truth table for: $(p \rightarrow r) \leftrightarrow (q \rightarrow r)$.

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8. Write the truth table for the following argument. You should have a column for each premise and for the conclusion. Circle the critical rows.

$$p \to q \lor r$$
$$\sim q \lor \sim r$$
$$\therefore \sim p \lor \sim r$$

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Is the argument valid? N0

9. Let P(x) be the predicate "x > 1/x". What is the truth set of P(x) if the domain of x is \mathbb{R} .

10. Rewrite the following:
a. "All rectangles are quadrilaterals"
vectangles x,x is a quadrilateral.
b. "Some sets have 16 subsets"
a get x such that X has 16 subsets.
11. Consider the statement " \forall real numbers x , if $x^2 \ge 1$ then $x > 0$."
a. Write the negation of the statement. \exists a real number X S.t. $X^2 \ge 1$ and \bigcirc
b. Write the converse of the statement.
y real numbers x, if x > 0 then x² ≥ 1.