Discrete Mathematics
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Exam 1
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Choose 4 problems only.

1. True/False? $\{(q \rightarrow p) \vee \neg q\} \oplus p \equiv q$

2. Is the following argument valid ?
   Premise 1: If today is Friday then the school is closed.
   Premise 2: If today is Friday then the school is not closed.
   Conclusion: Today is not Friday.

3. Let P(x,y): x^2 - y^2 $\leq$ 0. What is the value of

a) $\forall x, \forall y, P(x,y)$
b) $\forall x, \exists y, P(x,y)$
c) $\exists x, \forall y, P(x,y)$
d) $\exists x, \exists y, P(x,y)$
e) $\exists y, \forall x, P(x,y)$

4. Prove that if A and B are even numbers then A+B is also even.

5. Prove by induction: 2 + 4 + 6 + 8 + 10 + ... + 2n = n^2 + n

6. Convert the proposition $(q \rightarrow p) \rightarrow \neg q$ to a full DNF.