

Math 130

First Test

_____ (6 points)

This fun fifty minute test covers chapter one of *Mathematics: A Practical Odyssey* by Johnson and Mowry. Show your work and clearly indicate your answers. All parts of problems are five points unless otherwise indicated.

1. Fill in the blank with the most likely next term **and explain why** (using a short sentence) the pattern generated by your answer.

a) **1, 3, 7, 15, 31, _____**; because _____

b) **o, t, t, f, f, s, s, e, _____**; because _____

2. Fill in the blank with the letter that fits that pattern, then explain the general rule or pattern used to assign the given letter to the given word.

abe	bar	cat	dan	hat
d	q	s	m	

Rule:

3. Which of the following are statements? **Why or why not?** (3 pts each)

a) **The earth was created in six days, on the seventh God rested.**

b) **President Clinton has beautiful hair.**

c) **Can anyone get an A in this class?**

d) **$1 + 2 + 3 = 4$.**

4. Answer the following with complete sentences. (3 points each)

a) What is a disjunction?

b) Under what conditions is a conjunction true?

c) Explain the difference between truth and validity.

d) Explain the difference between inductive and deductive reasoning.

5. **Use a Venn diagram** to determine the validity of the following argument.

(Be sure to state your conclusion.)

All smart students take Mathematics 130.

GiGi is not smart.

Therefore, GiGi did not take Mathematics 130.

6. Construct a truth table for the symbolic expression: $p \rightarrow (\sim p \wedge q)$

7. Write the negation (in words) of the statement “**I do not understand negations and I am intelligent**”

8. Use the two statements

p : I vote for Perot

q : I take drugs

to write (in English) the sentences represented by each of the following.
(3 points each)

a) $p \rightarrow \sim q$

b) $q \rightarrow \sim p$

c) $\sim p \rightarrow q$

d) $\sim q \rightarrow p$

e) Which of pairs of parts a-d are equivalent? (Hint, two pairs)

9. Using **p : John has cancer**, and **q : John runs fast**, translate the following statements into symbolic form and then use truth tables to determine if they are equivalent.

John does not have cancer if he runs fast.

John does not run fast or he does not have cancer.

