Math 130 **May 9, 2003**

Second Exam

Name:_____ Section:_____

There are 100 possible points on this exam. Be sure to read each question carefully and answer the question asked. Show your work neatly and clearly– answers without justification may reduce your score. Partial credit may be given for a correct approach even if you don't get to the right answer.

GOOD LUCK!

Problem	Max	Score
1	15	
2	20	
3	20	
4	15	
5	10	
6	10	
7	10	
TOTAL	100	

Scratch Paper

1. Suppose we have

p="I take a walk"
q="I watch TV"
r="I eat potato chips"

Give an English translation for each of the following and write a truth table for each statement.

(a) $p \rightarrow \neg q$

(b) $(p \wedge \neg r) \vee q$

2. Compute the following:

   (a) $442_6 \times 23_6$

   (b) $10210_3 \div 12_3$

   (c) $11332_4 \div 312_4$

3. Determine which of the following statements are true for $\mathbb{N} = \{1, 2, 3, \ldots\}$. In each case, give evidence for your answer.

   (a) $\exists x \forall y, y - x = 0$

   (b) $\exists x \exists y, x - y = 0$

   (c) $\forall x \forall y, (x > y) \rightarrow (y - x < 0)$

   (d) $\forall x \forall y \exists z, y - x = x + z$

4. Benny has twice as much money as Garry initially. When Garry's mom gives Garry \$5, the ratio of Benny's money to Garry's money is $2 : 3$. If Benny's dad then gives Benny \$5, what will the new ratio of Benny's money to Garry's money be?

5. Ten years ago, Jenny was two times as old as Mary. Twenty years ago, she was three times as old. How old are they now?

6. Show that $(-1)(-1) = 1$

7. Thinking back to your group work, explain how one would add $1\frac{1}{4}$ to $2\frac{2}{3}$. You must fully expound upon any technique used.