

Fall 2003, Math 174, Exam 2

PRINT Your Name: _____

There are 10 problems on 4 pages. Each problem is worth 5 points.

CIRCLE your answers. **No Calculators.**

If I know your e-mail address, I will e-mail your grade to you. If I don't already know your e-mail address and you want me to know it, then **send me an e-mail.**

If you would like, I will leave your exam outside my office door later today, you may pick it up any time between then and the next class. **Let me know if you are interested.**

I will post the solutions on my website at about 1:30 today.

1. Write 55 in base 16.
2. What is negation of $3 < x \leq 7$?
3. Compute the sum $2 + 4 + 6 + 8 + \cdots + 196 + 198 + 200$.

4. Is the argument

$$\begin{array}{l} p \rightarrow q \\ q \\ \therefore p \end{array}$$

valid? Justify your answer.

5. True or False. If true, **prove** it. If false, then give a **counterexample**. For all integers a , b , and c , if $a|bc$, then $a|b$ or $a|c$.
6. True or False. If true, **prove** it. If false, then give a **counterexample**. For all integers a and n , if $a|n^2$, then $a|n$.
7. Re-write the following statement in if—then form.
Doing his homework regularly is a necessary condition for Jim to pass the course.
(The word “necessary” may not appear in your answer.)
8. True or False. If true, **prove** it. If false, then give a **counterexample**. For all real numbers x , $\lceil x + 2 \rceil = \lceil x \rceil + 2$.
9. Prove that n^2 has the form $3k$ or $3k + 1$ for all integers n .
10. Prove that $\sqrt{5}$ is irrational.