

# CHAPTER 0 TEST

No calculators, no cell phones, just you and a pen/pencil/

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Math 231  
September 3, 2008

Name: \_\_\_\_\_  
By printing my name I swear by the honor code.

1. Determine whether each of the following statements is true (T) or false (F).

**T F** If  $a$  is a real number, then  $-a$  is negative.

**T F** If  $x > 2$ , then  $x \geq 3$ .

**T F** There exists an integer  $x$  such that  $x \leq 1$  and  $x \geq 2$ .

**T F**  $3.5 \in \{x \in \mathbb{R} \mid x - 4 > 0\}$ .

2. Complete each of the following theorems. In each case  $A$  and  $B$  are real numbers or expressions.

$AB = 0$  if and only if:

$\frac{A}{B} = 0$  if and only if:

$AB > 0$  if and only if:

3. For the statement "If  $|x| \leq x$ , then  $x$  is positive," write down...

the converse:

the contrapositive:

the negation:

a counterexample:

4. Circle the inequality on the left whose solution set is shown on the right.

A)  $|x - 3| < 2$       C)  $|x - 1| < 5$

B)  $|x - 1| < 4$       D)  $|x - 5| < 1$



5. State the quadratic formula theorem and explain how to prove it. Don't *actually* prove it or do any of the algebra steps, but carefully and clearly explain what would have to be done to prove it.

6. Solve the inequality

$$\frac{4}{x-1} \geq 2$$

using the method of “cases” that was done in class and in the reading. Show all work clearly and in order. Take your time and write it up neatly, please. The quality of your work and reasoning is worth more than your final answer.