

CHAPTER 0 TEST

v.1

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

Math 231
September 3, 2008

Name: * key *
By printing my name, I swear by the honor code.

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

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- T F If a is a real number, then $-a$ is negative. HW 0.1 #42
- T F If $x > 2$, then $x \geq 3$. HW 0.4 #76
- T F There exists an integer x such that $x \leq 1$ or $x \geq 2$. HW 0.4 #56
- T F $3.5 \in \{x \in \mathbb{R} \mid x - 3 > 0\}$. HW 0.1 #12

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

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- $AB = 0$ if and only if: $A = 0$ or $B = 0$ HW 0.2 #16, thm. 0.1
- $\frac{A}{B} = 0$ if and only if: $A = 0$ but $B \neq 0$ HW 0.2 #17, thm. 0.8 // 2 pts A=0
- $AB < 0$ if and only if: $(A < 0 \text{ and } B > 0)$ or $(A > 0 \text{ and } B < 0)$ // 1 pt split // -1 no percent HW 0.3 #4, thm 0.11

3. For the statement "If x is not positive, then $|x| > x$," write down...

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- the converse: if $|x| > x$, then x is not positive
- the contrapositive: if $|x| \leq x$, then x is positive
- the negation: x is not positive and $|x| \leq x$ // 2 pts w/ if, th
- a counterexample: $x = 0$ All HW 0.4, #29-63

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

10 <
typo →
to fix
flip all
inequalities

- A) $|x - 1| \geq 5$
- C) $|x - 3| \geq 2$
- B) $|x - 5| \geq 1$
- D) $|x - 1| \geq 4$



HW 0.3 #12

65

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.

5 pts formula
10 pts proof, not how to use it

15

the sol'ns to $ax^2+bx+c=0$ are $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$.

to prove this, simply plug $x = \frac{-b + \sqrt{b^2-4ac}}{2a}$ and $x = \frac{-b - \sqrt{b^2-4ac}}{2a}$ into the eq'n $ax^2+bx+c=0$ and show that they make the eq'n true.

(i.e. $a\left(\frac{-b \pm \sqrt{b^2-4ac}}{2a}\right)^2 + b\left(\frac{-b \pm \sqrt{b^2-4ac}}{2a}\right) + c = 0$)

6. Solve the inequality

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

HW 0.5 #29, thm. 0.2

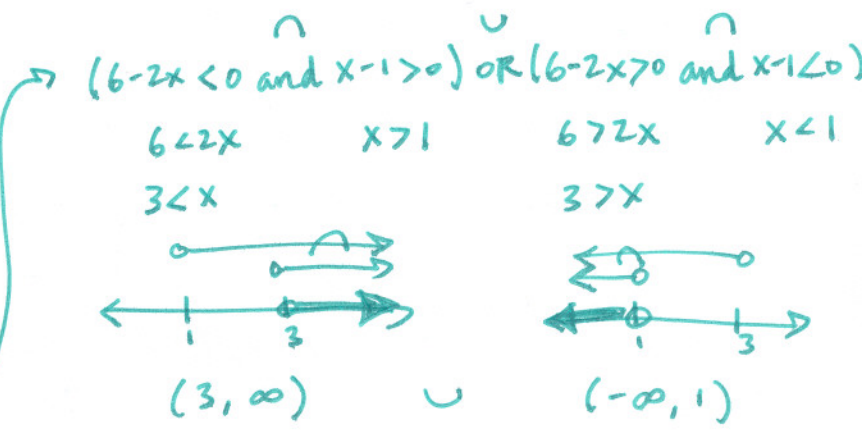
using the method of "cases" that was done in class and in the reading. Show all work clearly and in order. Take your time and write it up neatly, please. The quality of your work and reasoning is worth more than your final answer.

20

$\frac{4}{x-1} = 2$ when: $4 = 2(x-1) \Rightarrow 4 = 2x - 2 \Rightarrow 6 = 2x \Rightarrow x = 3$

$\frac{4}{x-1} < 2$ when:

$\frac{4}{x-1} - 2 < 0$
 $\frac{4 - 2(x-1)}{x-1} < 0$
 $\frac{4 - 2x + 2}{x-1} < 0$
 $\frac{6 - 2x}{x-1} < 0$



so final answer is: $(-\infty, 1) \cup [3, \infty)$.

HW 0.3 #1, 52, 58, example 0.17

1/3 pity
9 pts algebra ✓
12-13 alg + something
* MUST USE CASES *