

NAME: \_\_\_\_\_

NUMBER: \_\_\_\_\_

QUIZ over Section 5 in the 'CAT' book; 20 points.

1. Let  $x$ ,  $y$ , and  $z$  be real numbers.  
(2 pts) (1 pt) Suppose that  $x$  lies to the right of  $y$ , and  $y$  lies to the right of  $z$ . What (if anything) can be said about the relationship between  $x$  and  $z$ ?  
  
(1 pt) Suppose that  $x$  and  $y$  are both negative, and  $x$  lies to the left of  $y$  on the number line. What (if anything) can be said about the relationship between  $-x$  (the opposite of  $x$ ) and  $-y$  (the opposite of  $y$ )?
2. State how you would read each of the following sentences. Then, state whether the sentence is (always) true, (always) false, or ST/SF:  
(2 pts) (1 pt)  $-1 < -3$   
  
(1 pt)  $x \geq x$
3. Fill in the blanks:  
(2 pts) Being 'bigger than' has to do with being \_\_\_\_\_ .  
Being 'greater than' has to do with being \_\_\_\_\_ .
4. (1 pt) Consider the set  $S = \{0, 2, 4\}$ . What is the greatest member? The least?  
(3 pts) GREATEST: \_\_\_\_\_ LEAST: \_\_\_\_\_  
(1 pt) Consider the set  $S = \{-1, -2, -3, \dots\}$ . Does  $S$  have a greatest member? A least member? If so, what are they?  
GREATEST (if it exists): \_\_\_\_\_ LEAST (if it exists): \_\_\_\_\_  
(1 pt) Consider the set of nonnegative real numbers,  $[0, \infty)$ . Does this set have a greatest member? A least member?  
GREATEST (if it exists): \_\_\_\_\_ LEAST (if it exists): \_\_\_\_\_
5. Remember that mathematical sentences are often read in slightly different ways, depending on their context. How would you read the sentence ' $x > 1$ ' in each of the following contexts?  
(2 pts) (a) For all  $x > 1$  ...  
  
(b) Let  $x > 1$ .

6. Translate each phrase into a mathematical sentence:  
(2 pts)  $x$  is at most 3

(1 pt)  $t$  is at least  $-2$

7. Translate each sentence into an English phrase using the words 'at least' or 'at most':  
(2 pts)

(1 pt)  $x \geq 4$

(1 pt)  $y \leq 2$

8. Give three sentences of the form  $y = k$ . (Each sentence should use the variable  $y$ , but not  $k$ .)  
(1 pt)

FIRST:

SECOND:

THIRD:

9. Give an example of:  
(2 pts) an INEQUALITY in 2 variables:

an EQUATION in one variable:

10. Suppose that the sentence  $x(x - 1)(x + 3) = 0$  is true. What (if anything) can  
(2 pts) be said about  $x$ ?