Most therefore the statement is false and

Most everyone is familiar with the infinity symbol, the one that looks like the number eight tipped over on its side. Infinity sometimes crops up in everyday speech as a superlative form of the word many. But how many is infinitely many? How big is infinity? Does infinity really exist? You can't count to infinity. Yet we are comfortable with the idea that there are infinitely many numbers to count with; no matter how big a number you might come up with, someone else can come up with a bigger one; that number plus one, plus two, times two, and many others.

There simply is no biggest number. You can prove this with a simple proof by contradiction. Proof: Assume there is a largest number, n. Consider n+1. n+1*n. Therefore the statement is false and its contradiction, there is no largest integer, is true.

This theorem is valid based on the Validity of Proof by Contradiction. In 1895, a German mathematician by the name of Georg Cantor introduced a way to describe infinity using number sets. The number of elements in a set is called its cardinality. For example, the cardinality of the set 3, 8, 12, 4} is 4. This set is finite because it is possible to count all of the elements in it. Normally, cardinality has been detected by counting the number of elements in the set, but Cantor took this a step farther.

Because it is impossible to count the number of elements in an infinite set, Cantor said that an infinite set has No elements; By this definition of No, No+1= No. He said that a set like this is countable infinite, which means that you can put it into a 1-1 correspondence. A 1-1 correspondence can be seen in sets that have the same cardinality. For example, 1, 3, 5, 7, 9}has a 1-1 correspondence with 2, 4, 6, 8, 10}. Sets such as these are countable finite, which means that it is possible to count the elements in the set. Cantor took the idea of 1-1 correspondence a step farther, though. He said that there is a 1-1 correspondence between the set of positive integers and the set of positive even integers. E.

g. 1, 2, 3, 4, 5, 6, …n ..

.} has a 1-1 correspondence with 2, 4, 6, 8, 10, 12, ..

. 2n …

}. This concept seems a little off at first, but if you think about it, it makes sense. You can add 1 to any integer to obtain the next one, and you can also add 2 to any even integer to obtain the next even integer, thus they will go on infinitely with a 1-1 correspondence. Certain infinite sets are not 1-1, though.

Canter determined that the set of real numbers is uncountable, and they therefore can not be put into a 1-1 correspondence with the set of positive integers. To prove this, you use indirect reasoning. Proof: Suppose there were a set of real numbers that looks like as follows1st 4.

674433548…2nd 5. 000000000…

3rd 723. 655884543…4th 3. 547815886…

5th 17. 08376433…6th 0. 00000023..

. and so on, were each decimal is thought of as an infinite decimal. Show that there is a real number r that is not on the list. Let r be any number whose 1st decimal place is different from the first decimal place in the first number, whose 2nd decimal place is different from the 2nd decimal place in the 2nd number, and so on. One such number is r= 0.

5214211…

Since r is a real number that differs from every number on the list, the list does not contain all real numbers. Since this argument can be used with any list of real numbers, no list can include all of the reals. Therefore, the set of all real numbers is infinite, but this is a different infinity from No. The letter c is used to represent the cardinality of the reals. C is larger than No.

Infinity is a very controversial topic in mathematics. Several arguments were made by a man named Zeno, a Greek mathematician who lived about 2300 years ago. Much of Cantors work tries to disprove his theories. Zeno said, There is no motion because that which moved must arrive at the middle of its course before it arrives at the end.