1. RatNum(int n) creator
   RatNum(int n, int d) creator
   isNaN() observer
   isNegative() observer
   isPositive() observer
   compareTo(RatNum rn) observer
   doubleValue() observer
   intValue() observer
   floatValue() obsesrver
   longValue() observer
   negate() producer
   add(RatNum arg) producer
   sub(RatNum arg) producer
   mul(RatNum arg) producer
   div(RatNum arg) producer
   hashCode() observer
   equals(Object obj) observer
   toString() observer
   valueOf(String ratStr) constructor

2. The method can not be called unless the object already exist, so "this" is not null when the function can be called.

3. When call the function, it does not require a RatNum object to be created before the execution of the function. So the method should be static method. It can be accomplished by defining a constructor that takes in a String.

4. The modified function will change the parameter of this object, thus it violates the @modifies statement. The modified funtion also violates the @return statement because it returns the original object.

5. All implemented functions are not mutators, therefore the parameter of the object will not be modified after creation. The checkrep() at the end of the constructor guarantees that the object created is valid, thus all take- in RatNum object is valid. Therefore it does not require checkrep() at the beginning of the method. Since the method does not modify the object, it does not require checkrep() at the end of the method.