Create a Class

A circle in the Cartesian plane can be described uniquely by its centre and its radius. Thus, a class `Circle` that represents such circles should consist of information x-coordinate and y-coordinate of centre and radius.

1. Create a class `Circle` with the required instance fields.

2. Write the accessor and mutator methods for the instance fields.

3. Write a constructor method that has no parameters. The method should construct a `Circle` object with centre (0,0) and radius 1.

4. Write a constructor method that has three parameters representing the coordinates of the centre and the radius of the object to the constructed. The method should ensure that the circle's radius is not negative by changing the sign of any negative radius parameters.

5. Write a constructor method with a parameter, an object of type `Circle`. The method should construct a new `Circle` object with the same field values as those of the parameter.

6. Write an instance method `area` that returns, as a `double` value, the area of its implicit `Circle` object.

7. Write a method `smaller` that could be called by a statement like
   ```
   c3 = c1.smaller(c2);
   ```
   where `c1`, `c2`, and `c3` are objects of type `Circle`. The method should make `c3` refer to smaller of the circles represents by `c1` and `c2` (or `c1` if `c1` and `c2` are the same size)

8. Write a method distance that would returns the distance between the centre of the two circles specified by the implicit and the explicit object parameters.

9. Write the boolean-valued instance method is `isInside` that could be called by a statement like
   ```
   boolean contained = c1.isInside(c2);
   ```
   The method should return true if `c1` is entirely inside `c2` and return false otherwise.

10. Write a `boolean` instance method called equals that return `true` if and only if one `Circle` has identical centre and radius as another one.

11. Write a `toString` method for the Circle class. For a Circle object with `x = 3, y = -4`, and `r = 2`, the `toString` method should return a `String` with the value:
    "`centre: (3, -4)  radius: 2`".

12. Create a class `TestCircle` which contains the main method. The main method should perform the following actions:
    a. Create two `Circle` objects `c1`, representing the circle with centre `(4, -1)` and radius 3, and c2, representing the circle with centre `(3, -2)` and radius 5.
    b. Find and print the area of `c1`.
    c. Determine the smaller of `c1` and `c2` and then print its centre and radius.
    d. Deter whether or not `c2` lies entirely within `c1` and print an appropriate statement.
    e. Create a new reference, `c3`, to `c1`
    f. Create a new `Circle` object `c4`, with the same centre and radius as `c1`.

13. Draw diagrams to illustrate the results of executing the code in 12e and 12f.

14. What is the value of the expression `c1 == c3`?

15. What is the value of the expression `c1 == c4`?

16. What is the value of the expression `c1.equals(c4)`?