Problem 1: [24 points]

a) Why do we typically make our fields (instance variables) private instead of public?

b) What’s the difference between declaring and initializing a variable?

c) What is the difference between a field and a parameter?
public class CircleDrawer
{
    private Circle first;  // my most favorite circle
    private Circle second; // my second most favorite circle

    public void mystery()
    {
        Circle a;
        a = first;
        first = second;
        second = a;
        a = first;
    }
    // Other methods omitted...
}

Problem 2: [25 points]

1. Assume the mystery method above has been added to the CircleDrawer class from lab. If first and second are object references pointing to different circles before the method runs, do they still point to separate circles after the method runs or are they both pointing to the same circle? Explain? (Drawing a diagram might help you understand the code, though it’s not required for full credit.)

2. In English, describe what the method does. (Try to focus on what it does rather than a step-by-step description of how it works.) To get in the right frame of mind, think about what you would write as a comment for the method.
Problem 3: [25 points]

A client has asked that we add a method called `compare` to the Circle class. It should work like an equals method – it should take another circle as input and compare “us” to “them” – but instead of checking to see if the two circles are identical it should report how similar they are. Below, define the `compare` method. If the two circles have the same diameter and color, the method should print “Very similar”. If they have the same color but not the same diameter it should print “Sort of similar”, otherwise it should print “Not at all similar”.
Problem 4: [26 points]

According to the grading policy on our syllabus, there’s a 5% penalty if an assignment is turned in one day late and a 10% penalty for two days late. I typically don’t accept assignments more than two days late, so they’re worth 0 points after that. Below, write a method called `adjustedScore` that helps me adjust an assignment score based on its lateness. It should take two inputs: number of days late (which will always be expressed in a whole number of days), and the score received on the assignment (which might be something like 62.5). It should return an adjusted score that applies the appropriate late penalty. For example:

```python
> exam.adjustedScore(0, 100)  # 0 days late
100.0
> exam.adjustedScore(1, 100)  # 5% penalty, so 95 now
95.0
> exam.adjustedScore(3, 100)  # >2 days late, worth 0
0.0
> exam.adjustedScore(2, 50.5)  # 10% penalty, so -5.05
45.45
```