Problem Set 3, Part I

Please try to keep each of the three problems on its own page.

Problem 1: A class that needs your help
1-1) because the method product is a static method, not an instance method. So it cannot be called by an object.

1-2) *Revise the code found below:*

```java
public class ValuePair {

    private int a;

    private double b;


    public ValuePair(int a, double b) {

        this.setA(a);

        this.setB(b);

    }


    public double product() {

        return this.a * this.b;

    }


    public int getA() {

        return this.a;

    }


    public double getB() {

        return this.b;

    }


    public void setA(int newA) {

        if (newA % 2 != 0) {

            throw new IllegalArgumentException();

        } else {

            this.a = newA;

        }
```

```java
    }

    public void setB(double newB) {
        if (newB < 0.0) {
            throw new IllegalArgumentException();
        } else {
            this.b = newB;
        }
    }


    // add the new methods here


}
```

Problem 2: Static vs. non-static

2-1)

type and name of the variable	static or non-static?	purpose of the variable, and why it needs to be static or non-static
double rawScore	non-static	stores the raw score associated with a given Grade object; needs to be non-static so every Grade object will have its own instance of this variable
String category	non-static	Stores the type of each possible grade. The type may be assignments, quiz, or exam.
integer numQuiz	static	Stores the number of quiz objects created; it describes the feature of a group of quizzes, not a specific quiz, so it should be static.
integer numExam	static	Stores the number of exam objects created. it describes the feature of a group of exams, not a specific exams, so it should be static.
integer numAssign	static	Stores the number of assignment objects created.it describes the feature of a group of assignments, not a specific assignment, so it should be static.

2-2)
   a) **static or non-static?**: non-static
     explanation: because each object should have different categories.

   b) **changes it would need to make**: it should be a mutator method that can change the String category of the object from "quiz" to "exam".

2-3)
   a) **static or non-static?**: static
     explanation: because pointsEarned and possiblePoints are the only two parameters needed to calculate the percent. Fields do not needed.

   b) **example of calling it**: Grade.computePercent(30.0, 50.0)

2-4)
   a) **static or non-static?**: non-static
     explanation: because the extra score should be added to a specific score. The score can be assignment, quiz or exam.

   b) **example of calling it**:g.addExtraCredit(<mark>3.14159265</mark>)

Problem 3: Inheritance and polymorphism

3-1) Object class because every class in java needs to inherit the object class, and there is an "equal" method inside the Object class.

3-2) integer a, String b, integer x, integer y, String y

3-3)

which println statement?	which method is called?	will the call compile (yes/no?)	if the call compiles, which version of the method will be called?
first one	one()	yes	the Yoo version
second one	two()	yes	the Woo version
third one	three()	no	
fourth one	equals()	yes	the Zoo version
fifth one	toString()	yes	the Woo version

3-4)

```java
public class Too{

    public double avg() {

        return (this.getT() + this.getU() + super.getA()) / 3.0;

    }

}
```

3-5)

a) No: Too does not extend Woo.

b) Yes: Woo extends Zoo.

c) Yes: Yoo extends Woo that extends Zoo.

d) No: Zoo does not extend Too.