APCS Test 2 Review Sheet and Sample Test Questions

Terms and programming methods you should know:

Java.util.Scanner
New
Constructor
Class
Method
Field
Main
Function
Arguments
Return
Getter
Setter
Scope
Superclass
Subclass
Super()
Inheritance
Class Variables
Object
Instance
Instantiate
Declaration
Definition
Convention
Overloading

Things you should be able to do:

1. Write a simple custom class from scratch (it may extend another existing class)
2. Use that class in a main program
3. Given some commands, tell the output of the program
4. Given some commands, recreate the class that would define those commands (like we did with the bank account exercise)
5. Answer true/false and multiple choice questions based on material covered in class and the reading from chapters 2 and 3
6. And for and receive input from the user, which then may be used to affect the way your program runs.
Sample questions:

True or false:

A class that extends another class inherits only the super class’s variables, but methods and constructors must be redefined.

A variable declared inside of a constructor can be used throughout the your class.

A class’s constructor can be used to create a new instance of that class, ie an object.

Which statement about parameters is false?

A) The scope of parameters is the method in which they are defined.
B) Constructors can only have one parameter listed.
C) All parameters must be listed with their type.
D) Two different constructors can have the same number of parameters.

Given the following code, answer the remaining questions.

```java
public class Bicycle {
    public int cadence;
    public int gear;
    public int speed;

    public Bicycle(int startCadence, int startSpeed, int startGear) {
        gear = startGear;
        cadence = startCadence;
        speed = startSpeed;
    }

    public void setCadence(int newValue) {
        cadence = newValue;
    }

    public void setGear(int newValue) {
        gear = newValue;
    }

    public void applyBrake(int decrement) {
        speed = speed - decrement;
    }

    public void speedUp(int increment) {
        speed = speed + increment;
    }
}

public class MountainBike extends Bicycle {
    public int seatHeight;
```
public MountainBike(int startHeight, int startCadence, int startSpeed, int startGear) {
    super(startCadence, startSpeed, startGear);
    seatHeight = startHeight;
}

public void setHeight(int newValue) {
    seatHeight = newValue;
}
}

Given the code above, what commands would not compile and run properly?
Explain the problem with the ones that won't run.
   a) MountainBike a = new MountainBike(5, 12, 8, 4);
   b) Bicycle b = new Bicycle(4, 9, 2);
   c) Bicycle c = NEW Bicycle("3", "4", "5");
   d) MountainBike d = new MountainBike (new Bicycle(4, 5, 6), 7);
   e) MountainBike e = NEW MountainBike(3, 4, 5);

Create a new Bicycle object.

If your gear is not set to 7, write the command that would set the gear to 7.

Create a MountainBike object.

Apply the brakes to your mountain bike, such that it will come to a complete stop (if it was moving).

Given the code below, how fast is your Bicycle moving when the code stops executing, and what gear are you in?

Bicycle bike = new Bicycle(2, 5, 5);
bike.speedUp(7);
bike.speedUp(4);
bike.setGear(14);
bike.applyBrake(3);

Create a class for a new vehicle, a GoGoGadgetTrike. GoGoGadgetTrike should extend the Bicycle class, and also be able to do some unique things. Create a main program as well that uses the GoGoGadgetTrike class. Demonstrate what the GoGoGadgetTrike object you have created can do. Make sure your code compiles and works!