AP CS A – Karel J Robot
Review Sheet Chapter 4

Name: _________________________
Date: ______________ Per: _______

1. Define the following terms using YOUR own words/diagrams. I’m not looking for a book definition (in fact, you’ll get no credit if it resembles a book definition).

   - reference

   - object

   - class

2. What’s the difference between **class** and **object**?

3. Give an example of a NullPointerException (you may not use the one we used in class).

4. Using the “Binky Pointer” video from Stanford that we viewed in class (http://cslibrary.stanford.edu) switch all the code examples in the video to karel-type examples. In other words, you are sort of re-writing the video using robot examples. For each slide/phase of the video, write the new code example and explain (off to the side) what is going on (or what idea is being conveyed). Also, you should substitute the word “reference” for the word “pointer” that’s used in the video (“pointer” is not wrong – but we’ve been using “reference variable” in class).

   For example, you might start like this:

   ```
   Robot john;        // to get started we need a couple of references(video used ‘pointers’)
   Robot jane;        //  – initially, these refer to nothing
   ```

   the things that these references point to are called objects (video used ‘pointees’)

   so, now we need to instantiate some objects and refer to them.
   to instantiate an object you use:

   ```
      new Robot(1, 1, North, 0);               // we use the ‘new’ command
   ```

   now let’s make john refer to this new object:

   ```
      john = new Robot(1, 1, North, 0);
   ```

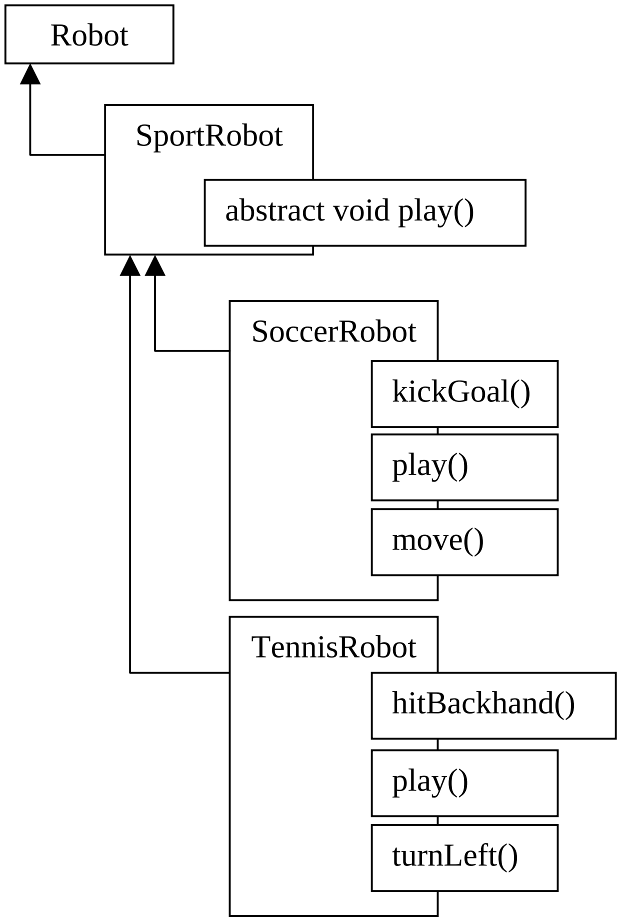
   .
   .
   .

   // you continue like this for the rest of the video…

   (note: don’t worry about storing numbers like the video does – just make method calls (e.g., move()) – it will allow you to convey the same meaning)

5. What would a move() method look like for a class (with superclass ur_Robot) that wanted to override the move(). It would like to redefine the meaning of move to mean: drop a beeper at the current location and then go forward 2 steps.

6. Using the following inheritance diagram, write code that would demonstrate polymorphism. You must give 2 different examples using 2 different types of references. You should document your code stating which statements are polymorphic and why.



7. Using the diagram above, which of these are legal (i.e., will compile)?

SportRobot tina = new SoccerRobot();
tina.play();

SportRobot tina = new SoccerRobot();
tina.move();

SportRobot tina = new SoccerRobot();
tina.kickGoal();

SportRobot tina = new SportRobot();
tina.play();