1. (6 points) What are three problem solving techniques presented in class?
   
i) Draw a picture, count, stepwise refinement, adopt a different perspective, add/remove a constraint, prototype.

2. (4 points) If you need to store information in a Java program, where do you store it? In a variable

3. (4 points) How do you change the value of a variable? Use and assignment statement.

4. (4 points) Assume you have an Object, called anObject. Write a statement to send it a doStuff message which has no parameters. anObject.doStuff()

5. (4 points) What is “pixel” an abbreviation for? What does it mean? Picture element, one dot on the screen.

6. (3 points) Write Java code to declare an variable of type Flopsy, named bunny. Flopsy bunny;

7. (3 points) Create an object of type Flopsy and store it in bunny. bunny = new Flopsy();

8. (3 points) Assuming it exists, what method in the Flopsy class is invoked by System.out.println(bunny); ? toString()

9. (3 points) How do you send information along with a message to an object? Put it in a parameter.

10. (3 points) Java is a typed language. What does that mean? All information in the program has a type.

11. (3 points) How many colors (exactly) are possible in Java? $256^3$

12. (6 points) What are the three attributes of every variable? type, name, value

13. How do you fix a bug you can’t find? You can’t!

14. (5 points) Assume you know you have a String representation of a number in a variable:

   String input = "17";

   You want to put twice its value into an int variable, like this

   int twice = input*2;

   But, it does not compile, saying: "operator * cannot be applied to int, java.lang.String" -- how to fix it (i.e. write a line of code to convert input to an int)?
   int x = Integer.parseInt(input);  

15. (4 points) Some inattentive programmer has written: int num = 123; then

    myTF.setText(num); and the compiler says: "Cannot find symbol. symbol: method setText(int)"

    -- show how to modify the parameter to setText so it works. myTF.setText(""+num);


17. (3 points) What characters are allowed in Java identifiers? Letters, digits, and underscores.

18. (3 pts) Assuming a programmer is following the capitalization convention, is foo an variable or a class? An object.
19. (6 points) What are three Java statements we have covered so far? assignment, return, message

20. (5 points) Assume you have an Account class, with an int variable, balance (as in lab 3). Write a method, withdraw(int) which will reduce the balance by the parameter.
void withdraw(int amt){
    balance = balance - amt;
}

21. (5 points) Write a method, named add, which returns the sum of its two int parameters.
int add(int x, int y){
    return x+y;
}

22. (10 points) Write a complete class named Square. Your class should have three int variables, x, y, and size, and three methods: accessors for the size variable, and void paint(Graphics) that draws a square with edge length size, and the upper left corner at (x,y).

class Square {
    int x, y, size;
    void setSize(int s) {
        size = s;
    }
    int getSize() {
        return size;
    }
    void paint(Graphics g) {
        g.drawRect(x,y,size, size);
    }
}

23. (10 points) Complete this class named Test. Fill in main so it creates two Squares, sets their sizes to 45 and 123, respectively, and then prints the size of each to the Output window.

class Test {
    public static void main(String [] args) {
        Square s1=new Square(), s2=new Square();
        s1.setSize(45);
        s2.setSize(123);
        System.out.println("s1 size= " + s1.getSize() + "  s2 size= + s2.getSize());
    }
}

24. (Extra credit 10 points) Write a complete RedSquare class which is identical with Square, except it draws itself with the square filled in with red. RedSquare is only allowed to have one method.

class RedSquare extends Square {
    void paint(Graphics g) {
        g.setColor(Color.red);
        g.fillRect(x,y,size, size);
    }
}