

Name: _____

NetID: _____

Answer all questions in the space provided. Write clearly and legibly, you will not get credit for illegible or incomprehensible answers. This is a closed book exam. However, each student is allowed to bring one page of notes to the exam. Print your name at the top of every page.

Question:	1	2	3	4	5	6	7	8	9	Total
Points:	5	10	12	12	18	15	12	6	10	100
Score:										

1. Given the variable declarations below, which of the following statements are valid? (Select all that apply.) (5)

```
int a = 1;
int b = 2;
int c = 7;
```

- A. `a = b;`
- B. `a = 67;`
- C. `b = 8.7;`
- D. `a + b = 8;`
- E. `a * b = 12;`
- F. `c = a - b;`
- G. `c = a / 2.3;`
- H. `boolean t = a;`
- I. `a /= 4;`
- J. `double d = a;`

2. Write the answer in the blank provided.

- (a) An array `arr` has 30 elements. What is the index of its last element? (2)
(a) _____
- (b) What is the keyword used to make a variable or method belong to a class? (2)
(b) _____
- (c) What is the keyword used to make a constant variable? (2)
(c) _____
- (d) What is the keyword used to restrict visibility of a member variable to methods within the enclosing class? (2)
(d) _____
- (e) What is the keyword used to distinguish a member variable from a parameter or local variable with the same name? (2)
(e) _____

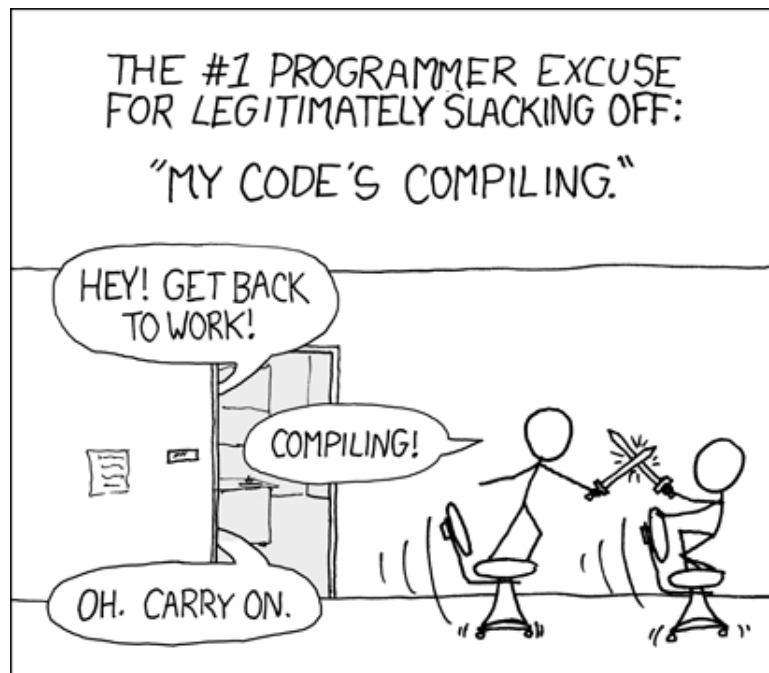
3. Multiple choice questions: Select the single correct answer for each.

- (a) If you want to use an existing class from the Java standard libraries, what keyword will you use near the top of your file? (2)
- A. `use`
 - B. `include`
 - C. `import`
 - D. `export`
 - E. `require`
- (b) What is the proper way to access the constant `PI` of the `Math` class? (2)
- A. `Math.PI()`
 - B. `Math.PI`
 - C. `PI`
 - D. `Math(PI)`
 - E. `Math[PI]`
- (c) A recursive method (2)
- A. is a method containing a loop.
 - B. has no parameters.
 - C. calls itself.
 - D. is part of the `java.recursion` package.
- (d) The name of the special type of method that creates objects of a class is (2)
- A. instantiator
 - B. initializer
 - C. creator
 - D. constructor
 - E. declarator
- (e) Which code would you use to create an array that could hold 25 double values? (2)
- A. `doubles vals = new double(25);`
 - B. `double vals = new double[25];`
 - C. `double vals[25];`
 - D. `double[25] vals;`
 - E. `double[25] vals = new double();`
 - F. `double[] vals = new double;`
 - G. `double[] vals = new double[25];`
 - H. `double[] vals = new double(25);`
 - I. `double[] vals = new [double](25);`
- (f) What is the value of the following expression? `2 + 4 + "six" + 8` (2)
- A. `"6six8"`
 - B. `"24six8"`
 - C. `"six14"`
 - D. `20`
 - E. This expression would result in a compilation error.

4. Given the definitions below, evaluate the following boolean expressions to true or false.

```
boolean kirk = true;  
boolean picard = false;  
boolean sisco = true;  
boolean janeway = false;
```

- (a) `kirk && picard` (a) _____ (2)
- (b) `kirk || picard || sisco` (b) _____ (2)
- (c) `!janeway` (c) _____ (2)
- (d) `!kirk || (!picard || sisco || janeway)` (d) _____ (2)
- (e) `!kirk && (!picard || sisco || janeway)` (e) _____ (2)
- (f) `(kirk || janeway) && (picard || janeway)` (f) _____ (2)



5. True or false questions

- (a) An improperly indented java file will not compile. (2)
(a) _____
- (b) It is legal to have more than one constructor in a given class. (2)
(b) _____
- (c) The name of a class *must* start with an uppercase letter. (2)
(c) _____
- (d) A constructor may be given any name, just like other methods. (2)
(d) _____
- (e) All the elements of an array must be the same type. (2)
(e) _____
- (f) An array can be returned by a method. (2)
(f) _____
- (g) In a two-dimensional array, every row must have the same number of columns. (2)
(g) _____
- (h) An object instance can not be passed as a parameter. (2)
(h) _____
- (i) A **String** is a primitive type in Java. (2)
(i) _____

6. The following Java program compiles and runs. What is its output?

(15)

```
public class MethodTest {  
  
    public static int foo(int a) {  
  
        int b = a % 5;  
        int c = b * 4;  
  
        System.out.println("a=" + a + ", b=" + b + ", c=" + c);  
  
        if(a < c) return b;  
        else return c;  
    }  
  
    public static void main(String[] args) {  
        int a = 6;  
        int b = 12;  
        int c = 14;  
  
        System.out.println("foo(" + a + ")=" + foo(a));  
        System.out.println("foo(" + b + ")=" + foo(b));  
        System.out.println("foo(" + c + ")=" + foo(c));  
    }  
}
```

7. The following Java program compiles and runs. What is its output?

(12)

```
public class Foo {  
  
    private int x;  
  
    public Foo(int x) {  
        this.x = x;  
    }  
  
    public void printStuff(int x) {  
        System.out.println(this.x);  
        System.out.println(x);  
    }  
  
    public static void main(String[] args) {  
  
        int x = 6;  
        Foo a = new Foo(x);  
        x--;  
        Foo b = new Foo(x);  
        x /= 2;  
        Foo c = new Foo(x);  
  
        a.printStuff(1);  
        b.printStuff(4);  
        c.printStuff(9);  
    }  
}
```

8. The following Java program compiles and runs. What are the *first* line, *third* line, and *last* line of its output? (I don't want all the output, just the lines specified.)

(6)

```
public class LoopNest {
    public static void main(String[] args) {

        String[] adj = {"Merry", "Joyful", "Enjoy", "Happy"};
        String[] occasion =
            {"Holidays", "Yule", "Festivus", "Christmas",
            "Kwanzaa", "Solstice", "Hanukkah", "New Year"};

        for(int a = adj.length-1; a > 0; a--) {
            for(int b = a; b < occasion.length; b+=a) {
                String greeting = adj[a] + " " + occasion[b] + "!";
                System.out.println(greeting);
            }
        }
    }
}
```

9. Write a method that takes an array of strings and a desired length and returns the count of the number of strings in the array with the given length. (10)

`{"a", "bb", "b", "ccc"}`, 1 \rightarrow 2

`{"a", "bb", "b", "ccc"}`, 3 \rightarrow 1

`{"a", "bb", "b", "ccc"}`, 4 \rightarrow 0

```
public static int wordsCount(String[] words, int len) {
```