

AP Computer Science: Test 1 Review Worksheet

Directions: To complete this review exercise, answer the following questions by creating space between questions and typing your answers below each question **using a different color font**. Successful completion of this review sheet adds +2 points to your final test grade.

1. What is the difference between a .java file and a .class file?

java is source code, class is bytecode

2. Which import statement is automatically included with every Java source file?

import java.lang.*;

3. In the space below, write the method header for the main method of every Java class.

public static void main(String[] args)

4. Convert the following numbers to decimal, binary or hex

a. 01101100 binary to decimal: $4 + 8 + 32 + 64 = 108$

b. 00001111 binary to decimal: $1 + 2 + 3 + 8 = 15$

c. 23 decimal to binary: 00010111

d. 255 decimal to binary: 11111111

e. 16 decimal to hex: 10

f. 78 decimal to hex: 4E

g. 8F hex to decimal: $8 * 16 + 15 = 143$

h. FF hex to decimal: 255

5. The code fragment below has multiple syntax errors. Assuming that the code is indented properly, rewrite the code, adding missing braces and/or semicolons as well as removing any extraneous symbols and spaces.

```
public boolean isAPerfectSquare(int num)    {  
    if(num / Math.sqrt(num) == Math.sqrt(num)) {  
        return true;  
    }  
    else  
        return false;  
}
```

6. If an image file uses 24-bits-per-pixel RGB color, how many different colors can be stored in that image?

$2^{24} = 1677216$ colors

7. What is the parent class of every user-defined class in Java?

object

8. What is the default state of a class variable (public or private) if the programmer forgets to include the `private` keyword at the declaration of a class variable?

`private`

9. What is the difference between a syntax error, a runtime error and a logic error?

`syntax = won't compile, runtime = crashes while running, logic = outputs an incorrect or unexpected value`

10. A programmer uses Eclipse to create a new class that they title "ObjectTest.java" In the class file itself, the programmer types the following code:

```
public class objectTest
```

Eclipse returns the error, "The public type `objectTest` must be defined in its own file." Why?

`ObjectTest` must be capitalized in all instances/occurrences in your code.

11. Describe two possible algorithms to determine if a base-10 integer is an odd number.

`Least most digit is a 1`

`the value % 2 is 1`

12. Write the code to test to see if a number entered is prime, e.g. its only factors are 1 and itself. The header for the method is below. You may use pseudocode or Java.

```
/**
 * If the variable num is prime, return true, false if not.
 * @param num The number to be tested.
 * @return True if the number is prime, false if not.
 */
public boolean isPrime(int num)    {

    //complete the method here
    for (int i = 2; i < num/2; i++) {
        if(num % i == 0)
            return false;
    }
    return true

}
```

13. What is an XOR gate?

`exclusive or, if else. Only one selection in the structure is activated`

14. Provide the code to display the following print statement:

```
File located at C:\>"My Documents\APCS\Test Review\review1.docx"  
System.out.println("File located at C:\\>\\\"My  
Documents\\APCS\\Test Review\\review1.docx\\\"");
```

15. In the space below, provide the complete class definition and constructor and method definition for a class called `Dog`. `Dog` should implement two instance variables, `name` (a `String`) and `age` (an `int`). Provide accessor and mutator methods for those instance variables and create a `toString` method for the class. Your definition should include two constructors, one default and one parameterized.

```
public class Dog {  
    private String name;  
    private int age;  
    public Dog() {  
        name = new String();  
        age = 0;  
    }  
    public Dog(String n, int a) {  
        name = n  
        age = a  
    }  
    public String getName() {  
        return name;  
    }  
    public int getAge() {  
        return age;  
    }  
    public void setName(String newName) {  
        name = newName;  
    }  
    public void setAge(int newAge) {  
        age = newAge;  
    }  
    public String toString() {  
        return name + "is " + age + "years old.";  
    }  
}
```