AP Computer Science
Practice Test 1

Name _____
Date _____ Period _____

1) True or False? Mark each blank clearly with a **T** or **F**

_____ (a) In Java, class names are case sensitive, but reserved words are not.

_____ (b) Every program, except applets, must have a main method.

_____ (c) A constructor must always have the same name as its class.

_____ (d) Syntax errors cause runtime exceptions.

_____ (e) An object's data elements are called instance variables or fields.

_____ (f) Only the number and types of parameters must match when passing to a method.

_____ (g) A constructor always has a void return type.

_____ (h) When a class is extended, new fields can be added.

_____ (i) A subclass inherits all of the constructors, methods, and fields of the superclass.

_____ (j) You always need access to a class' source code to use it.

2) Circle and label the 10 compiler errors in the following method.

a. variable already declared
b. cannot find symbol in java.lang.Math
c. possible loss of precision
d. found int, required boolean
e. ';' expected
f. String concatenation error
g. variable might not have been initialized
h. return value missing
i. '{' missing
k. missing declaration

```
public int whoIsIt (int a, b)
{
        int r = (int)(Math.random * a);

        if (r = b)
                System.out.println("a = " a);

        double [] dd;

        for(int count = 0; count < a; count++)
                dd[count] = count * 2.0;
        }

        int x = 9.5 * a;

        int r = a * b

        return;
}
```

3)Convert the decimal number (base 10) 341_{10} to both binary (base 2) and octal (base 8). Circle your answers.

4) Convert the hexadecimal number (base 16) $E58_{16}$ to both decimal (base 10) and binary (base 2). Circle your answers.

5) Given 2 positive integer values, return the larger value that is in the range 10 . . . 20, inclusive, or return 0 if neither is in that range.

For example:

max1020(11,19) should return **19**.
max1020(9,21) should return **0**.
max1020(20,7) should return **20**.
max1020(19,21) should return **19**.

public int max1020(int a, int b)

6) The sum $1 + (1/2) + (1/3) + (1/4) + (1/5) + (1/6) + \ldots + (1/n)$ increases without bound. That is, there is no limit to how big this sum can be, as long as n is big enough. What's the least value for n that will give us a sum of at least 2? Well, $1 + (1/2) + (1/3) = 11/6 < 2$, and $1 + (1/2) + (1/3) + (1/4) = 25/12 > 2$, so $n = 4$ is the least value necessary to achieve a sum of at least 2.

Write a flowchart that will take as input an **int** value named **targetSum**. The flowchart should determine the least **n** value necessary to achieve the **targetSum**, and return this value.

For example:
targetSum = 2 should return **4** because $1 + (1/2) + (1/3) + (1/4) = 25/12 > 2$ is the first sum greater than 2.
targetSum = 3 should return **11** because $1 + (1/2) + (1/3) + \ldots + (1/10) + (1/11) > 3$ is the first sum greater than 3.
targetSum = 5 should return **83** because $1 + (1/2) + (1/3) + \ldots + (1/82) + (1/83) > 5$ is the first sum greater than 5.

In writing this flowchart, you may assume that the **targetSum** is greater than or equal to 1.

7) Two positive integers are said to be **relatively prime** if they share no common factors except for 1. Write a method that takes in two positive **int**s in the parameter list, and determines if these two **int**s are relatively prime. The method should return **true** if the numbers are relatively prime, and **false** if the numbers are not relatively prime.

For example:

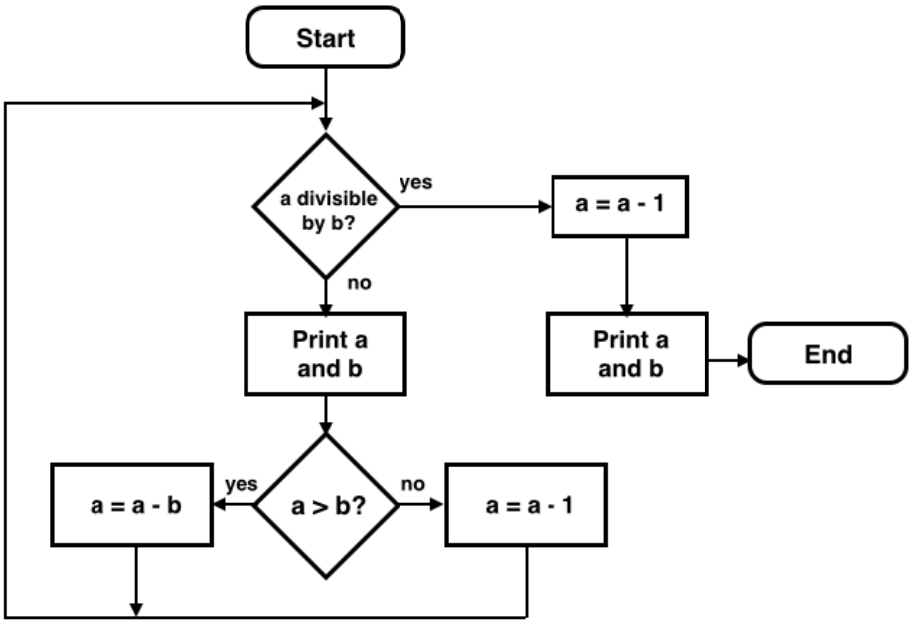
relativelyPrime(7,15) should return **true** because 7 and 15 share no common factor except 1.
relativelyPrime(14,49) should return **false** because 14 and 49 share a common factor of 7.
relativelyPrime(20,100) should return **false** because 20 and 100 share a common factor of 2 (and others).
relativelyPrime(8,21) should return **true** because 8 and 21 share no common factor except 1.

You may assume that the **int**s passed to this method are positive.

public boolean relativelyPrime(int x, int y)

8) The following flowchart takes two positive integers as input, **a** and **b**, and prints out the results to the screen. Write a method **secret()** that takes **a** and **b** as parameters and performs the actions of the flowchart. A sample output run is:

a = 20 b = 3
a = 17 b = 3
a = 14 b = 3
a = 11 b = 3
a = 8 b = 3
a = 5 b = 3
a = 2 b = 3
a = 1 b = 3
a = 0 b = 3



public voidsecret(int a, int b)