**Practical IB Computer Science Test #2—Methods**

Name: _____ Date: _____

Complete a series of methods in the Java class *PracticalTestQ2B.java*. Method signatures are given in the code to guide you. The only line you have to add to the main method is the one to follow instruction #1. There are comments to show you where to place this line, as well as the rest of the code you have to write.

Notes:

- You may need your notes, code and answers from the worksheets, from chapters 1 to 8 inclusive.
- You will need the ***gcd*** method from next page. Copy it or write it yourself. ( `static int gcd(int x, int y)`, returns the greatest common divisor of *x* and *y*.
- *Use the methods you wrote in previous instructions to solve the next ones.*

Work through the test from the beginning. Your program should build and grow –do not start a new program for each point. During this test, you may use any resources that you have created or provided to you by the teacher, but do **not** use Internet.

| ***Instructions*** | ***Program Display/Details*** |
|---|---|
| 1. *Output* your name on the screen. | `(Your name)` |
| 2. Complete the ***isEven*** method. | The method will return ***true*** if a number is even, ***false*** otherwise. |
| 3. Complete the ***isPositive*** method. | The method will return ***true*** if a number is positive or zero, ***false*** if it is negative. |
| 4. Complete the ***abs*** method. | The method will return the absolute value of an integer. |
| 5. Complete the ***isFactor*** method. | The method will return ***true*** if ***x*** is a factor of ***n***, ***false*** if it is not. |
| 6. Complete the ***listFactors*** method. | The void method will print out all the factors of an integer, from 1 up to and including the number/argument. |
| 7. Complete the ***countFactors*** method. | The method will return the count of factors (from 1 to the number inclusive) of an integer. |
| 8. Complete the ***isPrime*** method. | The method will return ***true*** if a number is prime, ***false*** otherwise. |
| 9. Complete the ***listPrimeFactors*** method. | The void method will print out all the ***prime*** factors of an integer. |
| 10. Complete the ***lcm*** (least common multiple) method. This method requires the GCD method shown next page. | The method will return the LCM of two integers. You may use the formula: $lcm(a,b) = \frac{\lvert a \times b \rvert}{\gcd(a,b)}$ Or, the LCM of ***a*** and ***b*** is the absolute value of ***a*** times ***b***, divided by the GCD of ***a*** and ***b***. |

Submit your Java source code file to the corresponding online homework entry before the end of the period. Good luck!

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```
// GCD by subtraction method
public static int gcd(int n, int m)
{
     int gcd = 0;
     if ( n == m )
     {    gcd = n;
     } else {
          while (n != m)
          {
               if ( m > n )
               {    m = m - n;
                    gcd = m;
               }
               else
               {    n = n - m;
                    gcd = n;
               }
          }
     }
     return gcd;
}
```

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