Name (print):  

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points:</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Score:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. (10 points) Evaluate each expression and give the result of the evaluation:

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 + 7 / 2.0</td>
<td>5.5</td>
</tr>
<tr>
<td>15.8 / 2 + 4</td>
<td>11.9</td>
</tr>
<tr>
<td>(int)(4.5 + 4.6)</td>
<td>9</td>
</tr>
<tr>
<td>(52 % 2 == 0) &amp;&amp; (5%2 != 0)</td>
<td>true</td>
</tr>
<tr>
<td>!(5 != 5) &amp;&amp; 4 &gt; 3</td>
<td>true</td>
</tr>
<tr>
<td>(int)(‘A’) + 2.3</td>
<td>67.3</td>
</tr>
<tr>
<td>&quot;Hello&quot; + &quot;9.0&quot;</td>
<td>Hello9.0</td>
</tr>
<tr>
<td>(double)17 / 2</td>
<td>8.5</td>
</tr>
<tr>
<td>9 - 9 * 0 == 10 - 1</td>
<td>true</td>
</tr>
<tr>
<td>true</td>
<td></td>
</tr>
</tbody>
</table>

**Precendence Rules:**

Expressions inside parentheses are evaluated first

Operators higher in the chart have higher precedence

Operators in the same row in the chart have equal precedence. Their associativity (e.g. L to R) determines tie breakers.

Parentheses may be used control order of evaluation

<table>
<thead>
<tr>
<th>Description</th>
<th>Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>parentheses</td>
<td>()</td>
</tr>
<tr>
<td>multiplication, division, mod</td>
<td>* / %</td>
</tr>
<tr>
<td>addition, subtraction</td>
<td>+, -</td>
</tr>
<tr>
<td>relational less/greater than operators</td>
<td>&lt; &lt;= &gt; &gt;=</td>
</tr>
<tr>
<td>relational equality operators</td>
<td>== !=</td>
</tr>
<tr>
<td>logical AND</td>
<td>&amp;&amp;</td>
</tr>
<tr>
<td>logical OR</td>
<td></td>
</tr>
</tbody>
</table>
2. (10 points) What is the output of the following statements:

(a) int a = 15;
    if ( --a < 15 ) {
        System.out.println(a);
    } else{
        System.out.println("0");
    }

    (a) 14

(b) int i = 21/5;
    if (i < 6) {
        while (i > 10) {
            i--;
        }
        } else if (i < 15) {
            i = 100;
        } else {
            i = 200;
        }
        System.out.println(i);

    (b) 4

(c) int i = 0;
    for (i = 3; i > 0; i--) {
        if (i == 1)
            break;
    }
        System.out.println(i);

    (c) 1
(d) int n;
    int k = 0;
    for(n = 0; n < 10; n++) {
        if (n < 2) {
            continue;
        }
        k = n;
    }
    System.out.println(k);

(d) 9

(e) int i = 0;
    int k = i;
    for (i = 2; i <= 10; i++) {
        if (i > 7 && i % 2 == 0) {
            k = i;
        }
    }
    System.out.println(i+k);

(e) 21
3. (10 points) What is the output of the following code listing:

```java
java.util.Scanner in = new java.util.Scanner(System.in);
int num = int.nextInt();
switch (num) {
    case 4: num = num + 3;
    case 5:
        for (int i = 0; i < num; i++) {
            num = i;
        }
        break;
    case 7:
        for (int n = 0; n < 10; n++) {
            if (n < num) {
                continue;
            }
            num = n;
        }
        System.out.println(num);
        break;
    default: num--;
}
System.out.println(num);
```

(a) What is the output of `num` when the input is 4?  
(a) 0

(b) What is the output of `num` when the input is 5?  
(b) 0

(c) What is the output of `num` when the input is 7?  
(c) 9

(d) What is the output of `num` when the input is 1?  
(d) 0
4. (10 points) Write a program that gets the input of two integer values, a and b, and computes the sum of the even numbers and computes the sum of the odd numbers from a through b (including b) using a loop. Print out the sum for both values. For example, if the user enters 2 and 8, the program should display 20 and 15 for the sum of the evens and odds, respectively.

```java
import java.util.Scanner;

public class EvenOdd {
    public static void main(String args[]) {
        Scanner in = new Scanner(System.in);
        int a = in.nextInt();
        int b = in.nextInt();
        /*----------- Your code here -------------*/
    }
}
```

Solution:

```
int sumOdds = 0;
int sumEvens = 0;
for (int i = a; i <= b; i++) {
    if (i % 2 == 0)
        sumEvens = sumEvens + i;
    else
        sumOdds = sumOdds + i;
}

Could also be done using a while loop:

```
int sumOdds = 0;
int sumEvens = 0;

while (a <= b) {
    if (a % 2 == 0)
        sumEvens = sumEvens + i;
    else
        sumOdds = sumOdds + i;
    a++;
}
```

Scoring:

- 1 declare variable for sum of odds
- 1 declare variable for sum of evens
- 2 use a for loop or while loop
- 2 add the sum of evens
- 2 add the sum of odds
- 2 valid code syntax
5. (10 points) Complete the program below. The program prompts for the height of three people in inches. Convert inches to feet and output how many of the people are AT LEAST six feet tall. (There are 12 inches in 1 foot.) You may assume the user always enters a valid, positive integer. You should output something like the following: “There are _ people taller than 6 feet” if you have more than 1 person taller than 6 feet. If only 1 person is taller than 6 feet then you should output “There is only 1 person taller than 6 feet”, and lastly, if no one is taller then 6 feet you should output “Everyone is under 6 feet tall.”

```java
import java.util.Scanner;

public class SixFooters {
    public static void main(String args[]) {
        Scanner in = new Scanner(System.in);
        int person1 = in.nextInt();
        int person2 = in.nextInt();
        int person3 = in.nextInt();
        /*----------- Your code here -------------*/

        Solution:
        int numTall = 0;
        if (person1/12 >= 6)
            numTall ++;
        if (person2/12 >= 6)
            numTall ++;
        if (person3/12 >= 6)
            numTall ++;
        if (numTall > 1)
            System.out.printf("There are %d people taller than 6 feet.\n", numTall);
        else if (numTall == 1)
            System.out.println("There is only 1 person taller than 6 feet");
        else
            System.out.println("Everyone is under 6 feet tall.");
    }
}
```

Scoring:
+1 declare variable for numTall
+2 increment numTall correctly
+2 check for more than 1 six footer
+2 check for only 1 six footer
+2 check for all under 6 ft
+1 valid code syntax

Alternative Scoring:
+3 check for more than 1 six footer
+3 check for only 1 six footer
+3 check for all under 6 ft
+1 valid code syntax