Loops

For exercises 1 to 15, indicate the output that will be produced. Assume the following declarations are made just before each exercise. That is, assume these initializations are in effect at the beginning of each problem:

```
final int MIN = 10, MAX = 20;
int num = 15;
```

1.
```
while (num < MAX)
{
   System.out.println (num);
   num = num + 1;
}
```

2.
```
while (num < MAX)
{
   num = num + 1;
   System.out.println (num);
}
```

3.
```
do
{
   num = num + 1;
   System.out.println (num);
}
while (num <= MAX);
```

4.
```
while (num < MAX)
{
   System.out.println (num);
   num = num - 1;
}
```

5.
```
while (num > MIN)
{
   System.out.println (num);
   num = num - 1;
}
```

6.
```
while (num < MAX)
{
   System.out.println (num);
   num += 2;
}
```

7.
```
while (num < MAX)
{
   if (num%2 == 0)
      System.out.println (num);
   num++;
}
```

8.
```
do
{
   num = num + 1;
   if (num*2 > MAX+num)
      System.out.println (num);
}
while (num <= MAX);
```

9.
```
for (int value=0; value >= 7; value++)
   System.out.println (value);
```

10.
```
for (int value=7; value < 0; value--)
   System.out.println (value);
```

11.
```
for (int value=1; value <= 20; value+=4)
   System.out.println (value);
```

12.
```
for (int value=num; value <= MAX; value++)
   System.out.println (value);
```

13.
```
for (int value=num; value <= MAX; value++)
   if (value%4 != 0)
      System.out.println (value);
```

14.
```
for (int count1=1; count1 <= 7; count1++)
{
   for (int count2=1; count2 <= 5; count2++)
      System.out.print ("#");
   System.out.println();
}
```

15.
```
for (int count1=1; count1 <= 5; count1++)
{
   for (int count2=1; count2 <= 5; count2++)
      System.out.print (count1*count2 + "   ");
   System.out.println();
}
```

For exercises 16 to 29, write code segments that will perform the specified action.

16. Verify that the user enters a positive value. (use a while loop)

17. Verify that the user enters an even value (use a do loop)

18. Read and print values entered by a user until a particular sentinel value is encountered. Do not print the sentinel value. Assume the sentinel value is stored in a constant called `SENTINEL`.

19. Read values from the user, quitting when a sentinel value of 0 is entered. Compute and print the product of all values entered (excluding the sentinel value).

20. Print the odd numbers between 1 and 100.

21. Print the multiples of 3 from 300 down to 3.

22. Print the numbers between LOW and HIGH that are evenly divisible by four but not by five.

23. Print all of the factors of a value stored in the variable `number`. Assume the value is positive.

24. Read 10 values from the user and print the lowest and highest value entered.

25. Determine and print the number of times the character `'a'` appears in the `String` variable `str`.

26. Print the characters stored in the `String` variable `str` backwards.

27. Print every other character in the `String` variable `str` starting with the first character.

28. Print a sequence of asterisk characters in the following configuration, continuing for LINES number of asterisks.

```
*
 *
  *
   *
    *
     *
      *
```

29. Print the characters of a `String` variable `str` in a diagonal line downward. For example, if `str` contained `"Compile"`, the output would be:

```
C
 o
  m
   p
    i
     l
      e
```