Lecture 12: Loops Worksheet

1) When the following loops execute, how many times do they print "Duck"?

```java
int i = 0;
while (i <= 3) {
    println("Duck");
    i = i + 1;
}
println("Goose");
// How many ducks? ______
```

```java
int i = 1;
while (i < 10) {
    println("Duck");
    i = i + 3;
}
println("Goose");
// How many ducks? ______
```

2) Fill in the table below detailing what happens on every iteration of the loop:

```java
int v = 1;
while (v != -5) {
    rect(10*v, 10*v, 20, 20);
    v = -2*v+1;
}
```

<table>
<thead>
<tr>
<th>Iteration</th>
<th>v</th>
<th>Condition</th>
<th>Executed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>true</td>
<td>rect(10, 10, 20, 20);</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) Given the loop below, draw the result on the grid using Processing's coordinate system:

```java
noFill();
int i = 1;
while (i <= 3) {
    rect( 2*i-1, i, 4-i, 4-i);
    i = i + 1;
}
```

(0,0)
4) Complete the loop below to draw the 4 circles of radius 30 shown in the image:

```
int c = ____;
while (c ___ ______) {
    ________________________________;
    c = __________;
}
```