1) What are the first and last numbers output by the code segment?

```
let c = 100;
while (c > 0) {
   console.log(c);
   c -= 10;
}
```

A. 100 and 0.
B. 90 and 0.
C. 100 and 10.

2)What condition makes the loop output the even numbers 2 through 20?

```
let c = 2;
while (_____) {
   console.log(c);
   c += 2;
}
```

A. `c >= 20`
B. `c <= 20`
C. `c < 20`

3) What is the value of `c` when the loop terminates?

```
let c = 10;
while (c <= 20); {
   console.log(c);
   c += 5;
}
```

A. 25
B. 20
C. The loop never terminates.

4) What is `c` when the loop terminates?

```
let c = 10;
while (c <= 20)
   console.log(c);
   c += 5;
```

A. 15
B. 20
C. The loop never terminates.

Answers

1. C

The loop terminates when `c` is 0. At the start of the last iteration `c` is 10. `c` is then decremented to 0. The loop condition is checked: 0 > 0 is false, and the loop terminates.

2. C

The last time the loop outputs a value is when `c` is 20.

3. C

The semicolon after the while condition creates an infinite loop. While loops should never have a semicolon after the condition.

4. C

Even though `c += 5` is indented, only `console.log(c)` is in the loop body because the while loop does not have `{ }` around both statements. Therefore, `c` never increments, and 10 is output repeatedly in an infinite loop.

Do While

1) What is the last number output to the console?

```
let c = 10;
do {
   console.log(c);
   c--;
} while (c >= 5);
```

2)
Write a condition that executes the do-while loop as long as the user enters a negative number.

```
let num;
do {
   num = prompt("Enter a negative number:");
} while (______);
```

CheckShow answer

3)
What is the last number output to the console?

```
let x = 1;
do {
   let y = 0;
   do {
      console.log(x + y);
      y++;
   } while (y < 3);
   x++;
```

```
} while (x < 4);
```

Answers

1. `5`

The numbers 10, 9, 8, 7, 6, 5 are output. After 5 is output, `c` becomes 4, and the loop terminates

2. `num < 0`

The loop terminates when `num` is greater than or equal to 0.

3. `5`

The outer loop executes when `x` is 1, 2, and 3. The inner loop executes when `y` is 0, 1, and 2. So `x` is 3 and `y` is 2 the last time both loops execute, producing 3 + 2 = 5.

A given insect population doubles every week. If 2 insects exist on the first week, how many weeks will pass until the insect population exceeds 10,000 insects? Use a `while` loop to output the insect population each week until the population exceeds 10,000 insects.

Researchers have discovered that every 4 weeks a disease is killing 40% of the insect population after the population has reproduced. If 2 insects exist on the first week, how many weeks will pass until the insect population exceeds 10,000 insects? Write a second `do-while` loop that outputs the insect population each week until the population exceeds 10,000 insects. Decimal places will appear in the number of insects after removing 40% of the population on week 4.

```
// Write the while and do-while loops here!
//Part 1
insectPop = 2;
console.log(insectPop);
numWeeks = 1;

while (insectPop < 10000)
{
   insectPop = insectPop*2;
   console.log(insectPop);
```

```
   ++numWeeks;
}
console.log("It will take " + numWeeks + " weeks for the
insect population to exceed 10,000 insects");
console.log("");

//Part 2
insectPop = 2;
console.log(insectPop);
numWeeks = 1;
numKilled = 0;
do {
   insectPop = insectPop*2;
   console.log(insectPop);
   ++numWeeks;
   if (numWeeks % 4 === 0)
   {
      numKilled = insectPop * 0.4;
      insectPop = insectPop - numKilled;
   }
} while (insectPop < 10000);
console.log("It will take " + numWeeks + " weeks for the
insect population to exceed 10,000 insects when 40% of
the population is killed by disease every 4 weeks.");
```