

1. the purpose is to execute a set of statements repeatedly based on a condition to see if its true

2. The while statement evaluates the condition before the statements are executed
The do while statement evaluates the condition after the first execution of a loop.

3. Prompter review page. 103

4. a) A loop that continues executing forever

b) syntax, logic or overflow errors.

Logic errors can occur when a condition of the loop always remains true.

This is an infinite loop because of the semicolon:

```
while (num > 0);  
{  
    Num += 1;  
}
```

c) This is an overflow error causing an infinite loop, it occurs when there aren't enough bits to store a number.

```
Int num = 1
```

```
do
```

```
{  
    Num += 1;  
}
```

```
While (num >= 0);
```

5. 60

6. No value of x would make the loop infinite

7. Counters are useful for keeping track of the number of times a user enters a value, makes a guess or types a password.

A counter should be initialized when it's declared and then incremented by a constant value.

Accumulators are used to sum values as they are entered by the user and are incremented by a varying amount.

An accumulator should be initialized when it's declared.

8. for (int i = 3; i <= 10; i++);

```
{  
    sum += i;  
}
```

9. If the loop executes at least once and if the number of times the loop should be executed is fixed.