AP Java Worksheet Nested Loops Name_____

Let's say I wanted to make the following pattern of Xs:

```
X X X X X
X X X X X
X X X X X
```

I could write a loop to make six Xs, and cut and paste it three times like this:

```
for(int i = 1; i <= 6; i++)
{
   System.out.print("X ");
}
System.out.println();
for(int i = 1; i <= 6; i++)
{
   System.out.print("X ");
}
System.out.println();
for(int i = 1; i <= 6; i++)
{
   System.out.print("X ");
}
System.out.println();
```

1. There's a better way. Anytime I'm doing the same thing over and over again, I can save myself work by using a loop. Complete the following so that it produces the pattern of Xs.

```
for(_____ ; _____; _____)
{
  for(int i = 1; i <= 6; i++)
  {
    System.out.print("X ");
  }

  _____ ;
}
```

Putting a loop inside another loop is called nesting. The outer loop is the one on the top. The inner loop is the one on the inside that produced the six Xs. The pattern of Xs had three rows and six columns.

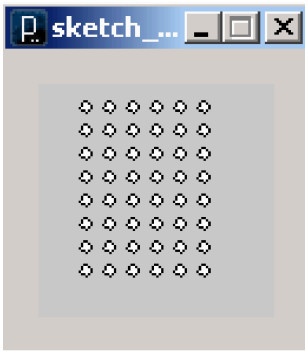
2. Which loop generates the 6 columns, the outer or the inner?

3. Which loop generates the 3 rows, the outer or the inner?

4. Write a program using nested loops that will create the following pattern of Xs

```
X X X X X
X X X X X
X X X X X
X X X X X
for(_____; _____; _____)
{
  for(_____; _____; _____)
  {
    _____;
  }
  _____;
}
```

Let's say I wanted to make a grid of circles that looked like this
I can tell it has 8 rows and 6 columns
So I'll need appropriate loops



Each row has a different y coordinate.

Each column has a different x coordinate.

So, I might start with something like this:

```
for(int y = ?? ; y <= ?? ; y ?? ) //8 rows
{
  for(int x = ?? ; x <= ?? ; x ?? //6 columns
  {
    ellipse(x,y,5,5);
  }
}
```

Figuring out how to finish this is kind of "guess and check." If the size of my screen is 100 by 100, I could use numbers like this:

```
for(int y = 10 ; y <= 80 ; y +=10 ) //8 rows
{
  for(int x = 20 ; x <= 70 ; x +=10 //6 columns
  {
    ellipse(x,y,5,5);
  }
}
```

5. Write a program using nested loops that will create a pattern of ellipses like this:

