Solutions for exercise 19

PointInterface

```
interface PointInterface{
    public void move(int dx, int dy);
    //moves the point dx in the x-direction and dy in the y-direction
}
```

1 Point (Question 1)

```
class Point implements PointInterface {
  private int x, y;

  Point(int x, int y) {this.x = x; this.y = y;}

  public boolean equals(Point p) {return this.x == p.x && this.y == p.y ;}

  public String toString() {return "(" + x + ", " + y + ")" ;}

  public void move(int dx, int dy) {x = x + dx ; y = y + dy;}

}
```

2 Other implementations (Question 2)

Polar coordinates.

3 TestPoint

```
public class TestPoint {
  public static void main (String[] args) {
    Point p1 = new Point(5,10);
    Point p2 = new Point(5,10);
    printpoints(p1, p2);
    p1.move(2,2); printpoints(p1, p2);
    p1 = p2; printpoints(p1, p2);
    p1.move(2,2); printpoints(p1, p2);
  }
  static void printpoints(Point p1, Point p2) {
    System.out.println("p1 s coordinates are " + p1);
    System.out.println("p2 s coordinates are " + p2);
    System.out.println("p1 == p2: " + (p1 == p2));
    System.out.println("p1.equals(p2): " + p1.equals(p2) + "\n");
  }
}
```

The memory's content at writes (Question 3)

Figure (made by Kim): Obtainable from the page containing solutions to the exercises.

Output from TestPoint (Question 3)

```
p1 s coordinates are (5, 10)
p2 s coordinates are (5, 10)
p1 == p2: false
p1.equals(p2): true

p1 s coordinates are (7, 12)
p2 s coordinates are (5, 10)
p1 == p2: false
p1.equals(p2): false

p1 s coordinates are (5, 10)
p2 s coordinates are (5, 10)
p1 == p2: true
p1.equals(p2): true

p1 s coordinates are (7, 12)
p2 s coordinates are (7, 12)
p1 == p2: true
p1.equals(p2): true
```