```
import java.util.Scanner;

public class LinearEquationRunner
{
    public static void main(String[] args)
    {
        int x1 = -1;
        int y1 = 5;
        int x2 = 3;
        int y2 = 10;
        LinearEquation equation = new LinearEquation(x1, y1, x2, y2);
        System.out.println("Equation: " + equation.equation());
        System.out.println("Slope: " + equation.slope());
        System.out.println("y-intercept: " + equation.yIntercept());
        System.out.println("Distance: " + equation.distance());
        System.out.println();
        System.out.println("----- Line info -----");
        System.out.println(equation.lineInfo());
        System.out.println();
        double testX = 4;
        System.out.println("Coordinate for x: " + equation.coordinateForX(testX));


        boolean testing = true;

//      Scanner scan2 = new Scanner(System.in);
//      System.out.println("Welcome!");
//      System.out.print("Enter coordinate 1: ");
//      String coord3 = scan2.nextLine();
//      System.out.print("Enter coordinate 2: ");
//      String coord4 = scan2.nextLine();
//      System.out.println();
//      System.out.println("These points are on the vertical line, x = 5,");
//      System.out.println("which is not a linear equation. Goodbye!");
//
//
        if (testing)
        {
            Scanner scan = new Scanner(System.in);
            System.out.println("Welcome!");
            System.out.print("Enter coordinate 1: ");
            String coord1 = scan.nextLine();
            System.out.print("Enter coordinate 2: ");
            String coord2 = scan.nextLine();
            System.out.println();
            LinearEquation eq = new LinearEquation(5, 7, 5, -3);
            System.out.println(eq);
            System.out.println();
            System.out.print("Solve for x or y? "); // x
            String xOrY = scan.nextLine();

            if (!testing)
            {
                System.out.print("Enter a value for x: "); // 4
                Double value = scan.nextDouble();
                System.out.println();
            //    System.out.println("The point on the line is " + eq.coordinateForX(value));
            }
            else
            {
                System.out.println("These points are on a vertical line: x = 5");
            }
//            else
//            {
//                System.out.print("Enter a value for y: ");
//                Double value = scan.nextDouble();
//                System.out.println();
//                System.out.println(eq.coordinateForY(value));
//            }
        }

        LinearEquation eq1 = new LinearEquation(-1, 5, 3, 10); // good for 5/4 slope
        LinearEquation eq2 = new LinearEquation(-6, -2, 1, -1); // good for 1/7 slope
        LinearEquation eq3 = new LinearEquation(2, 10, -1, 3); // good for 7/3 slope
        LinearEquation eq4 = new LinearEquation(-1, 4, -7, 12); // good for -8/6 slope
        LinearEquation eq5 = new LinearEquation(1, 4, 7, 12); // good for 8/6 slope
        LinearEquation eq6 = new LinearEquation(4, 0, 6, 10); // good for 5 slope
        LinearEquation eq7 = new LinearEquation(7, 14, 5, 10); // good for 2 slope NO Y-INT
        LinearEquation eq8 = new LinearEquation(6, 2, 8, -12); // good for -4 slope
        LinearEquation eq9 = new LinearEquation(-1, 3, 2, 6); // good for +1 slope
        LinearEquation eq10 = new LinearEquation(-1, 2, -3, 4); // good for -1 slope
        LinearEquation eq11 = new LinearEquation(-2, -2, 4, 4); // good for line through origin
        LinearEquation eq12 = new LinearEquation(3, 12, 7, 2); // good for -10/4 slope
        LinearEquation eq13 = new LinearEquation(7, 12, 3, 2); // good for 10/4 slope
        LinearEquation eq14 = new LinearEquation(7, 12, 3, 12); // good for horizontal
        LinearEquation eq15 = new LinearEquation(16, -2, 3, -2); // good for horizontal
        LinearEquation eq16 = new LinearEquation(0, 0, 4, 5); // good for 5/4 slope
        LinearEquation eq17 = new LinearEquation(1, -10, -3, 2); // good for -3x - 7

        //System.out.println(eq17);
    }
}
```

```java
public class LinearEquation
{
    private int x1, y1, x2, y2;

    public LinearEquation(int x1, int y1, int x2, int y2)
    {
        this.x1 = x1;
        this.x2 = x2;
        this.y1 = y1;
        this.y2 = y2;
    }

    public double distance()
    {
        double sumOfSquares = Math.pow((x2 - x1), 2) + Math.pow((y2 - y1), 2);
        double sqrt = Math.sqrt(sumOfSquares);
        return roundedToHundredth(sqrt);
    }

    public double yIntercept()
    {
        double b = y1 - slope()*x1;
        return roundedToHundredth(b);
    }

    public double slope()
    {
        double slope = (double) (y2 - y1) / (x2 - x1);
        return roundedToHundredth(slope);
    }

    public String equation()
    {
        if (isHorizontal())
        {
            return "y = " + y1;
        }

        String str = "y = " + printableSlope() + "x" + printableYIntercept();

        return str;
    }

    public String printableYIntercept()
    {
        if (yIntercept() < 0)
        {
            return " - " + Math.abs(yIntercept());
        }
        else if (yIntercept() > 0)
        {
            return " + " + yIntercept();
        }
        else
        {
            return "";
        }
    }
    public String printableSlope()
    {
        int num = y2 - y1;
        int den = x2 - x1;

        if ((double) num / den == -1)
        {
            return "-";
        }
        else if ((double) num / den == 1)
        {
            return "";
        }
        else
        {
            int mod = num % den;
            if (mod == 0)
            {
                return "" + (num / den);
            }

            num = Math.abs(y2 - y1);
            den = Math.abs(x2 - x1);

            String str = num + "/" + den;

            if (slope() < 0)
            {
                return "-" + num + "/" + den;
            }
            else
            {
                return num + "/" + den;
            }
        }
    }

    public String coordinateForX(double xValue)
    {
        double y = slope() * xValue + yIntercept();
        return "(" + xValue + ", " + roundedToHundredth(y) + ")";
    }

    public String coordinateForY(double yValue)
    {
        if (isHorizontal())
        {
            if ((int) yValue == y1)
            {
                return "All points on this line have " + yValue + " as the y value.";
            }
            else
            {
                return "No points on this line have " + yValue + " as the y value.";
            }
        }
        else
        {
            double x = (yValue - yIntercept())/slope();
            return "(" + roundedToHundredth(x) + ", " + yValue + ")";
        }
    }

    public boolean isHorizontal()
    {
        return y2 == y1;
    }

    public double roundedToHundredth(double toRound)
    {
        double roundedNumber = Math.round(toRound * 100) / 100.0;
        return roundedNumber;
    }

    public String toString()
    {
        String str = "The two points are: (" + x1 + ", " + y1 + ")";
        str += " and " + "(" + x2 + ", " + y2 + ")";
        str += "\nThe equation of the line between these points is: " + equation();
        str += "\nThe slope of this line is: " + slope();
        str += "\nThe y-intercept of the line is: " + yIntercept();
        str += "\nThe distance between the two points is: " + distance();

        return str;
    }

    public String lineInfo() {
        return toString();
    }
}
```