

**1. Draw lines with random number**

Extend from HW2 Q4 (fig 3). Dividing each edge into an equal number of increments. For each successive line, move down one increment on the left edge and right one increment on the bottom edge. **The figure should scale as you resize the window so that the endpoints always touch the edges.** Please put main program and other programs in different files.

The number of lines should be a random integer from 10-99, the color of lines should be randomly generated.

Finally, Mark the JPanel size. Print width on the top of the JPanel and height on the right of the JPanel.

Note:

**1. Set line color**

EX: `g.setColor(new Color(255, 0, 0)); //Red`

**2. Random number**

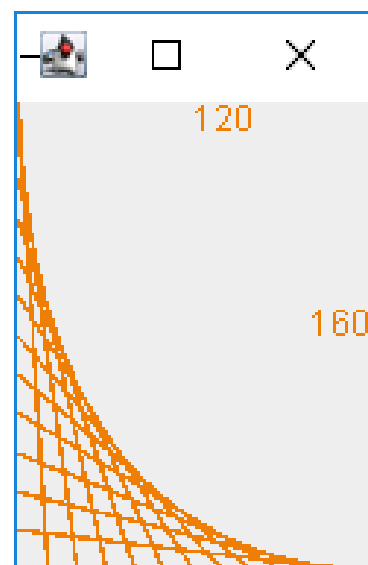
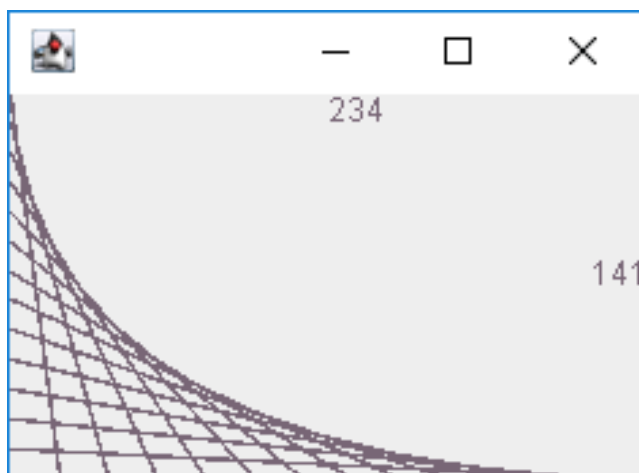
EX: `n = Math.random() * m;`

// n is random number in the range [0,m), n is real number.

**3. Dimension of JPanel**

`int w = (int)super.getWidth();`

`int h = (int)super.getHeight();`

**Sample Output**

## 2. Incircle 內切圓

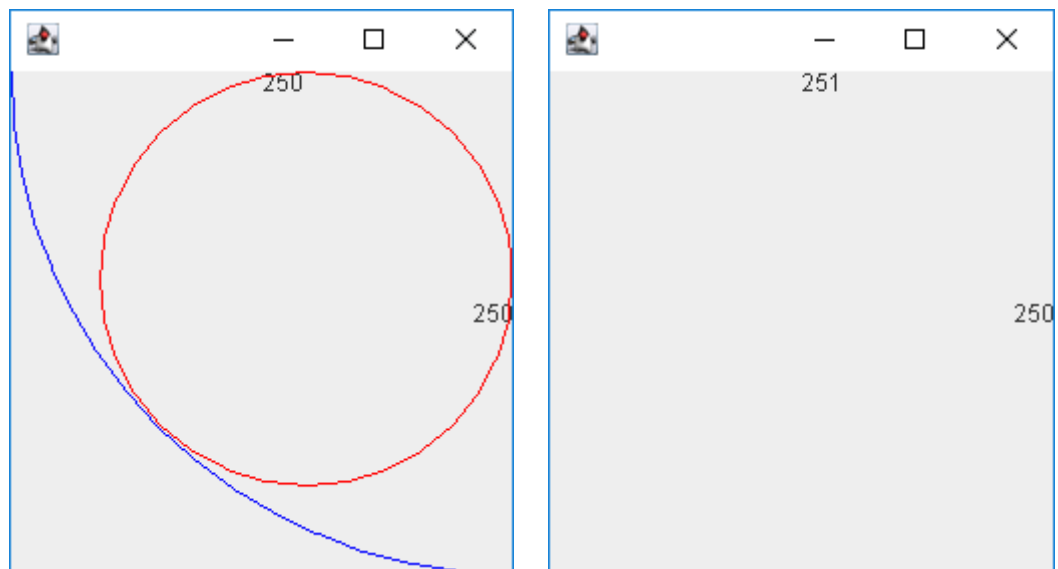
Prompt an integer from user to determine the JPanel size. Print width on the top of the JPanel and height on the right of the JPanel. When the width is equal to the height, plot a quarter circle on the top-right corner, then plot an incircle of this quarter circle. Draw the incircle in red and the quarter circle in blue.

Note that the size of JFrame contains the border size, you should deal with it.

### Sample Input

```
Windows PowerShell
PS C:\Users\USER\Desktop\JAVA\04 HW2Lab> java Q2
Input window size:
250
```

### Sample Output



### 3. Excircle of a triangle (I) 外接圓

Prompt the user to input three points as the vertices of a triangle, and then

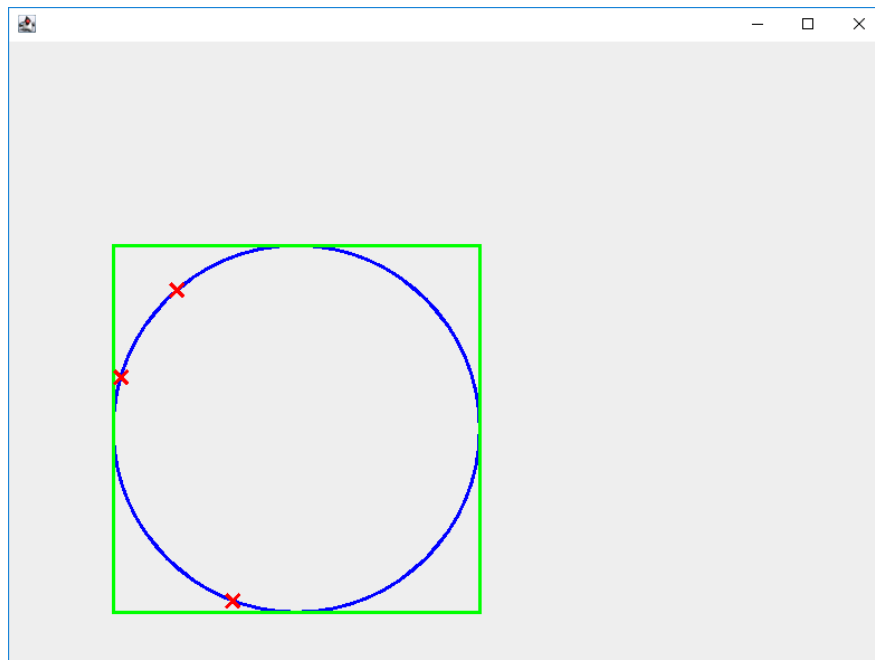
- 1) plot the excircle of this triangle on JPanel. Draw the excircle in blue.
- 2) plot a circumscribed square which's side is horizontal or vertical and draw it in green.
- 3) mark the three points with red color and print out the circumcenter of these three points.
- 4) print out the distances between the circumcenter and three points.
- 5) Set line thickness with different values.

```
// java.awt.*;  
Graphics2D g2 = (Graphics2D) g;  
g2.setStroke(new BasicStroke(3));
```

#### Sample Input

```
Windows PowerShell  
PS C:\Users\USER\Desktop\JAVA\04 HW2Lab> java Q3  
Input three point (x y):  
100 300  
200 500  
150 222  
The circumcenter of three point is (257,346)  
164.210231 163.600122 163.783394
```

#### Sample Output



#### 4. Excircle of a triangle (II) 外接圓

Prompt the user to input three points as the vertices of a triangle, and then

- 1) plot the excircle of this triangle on JPanel. Draw the excircle in blue.
- 2) plot a inscribed square which's side is horizontal or vertical and draw it in green.
- 3) Mark the three point with red color and print out the circumcenter of these three points.
- 4) print out the distances between the circumcenter and three points.
- 5) Set line thickness with different values.

```
// java.awt.*;
```

```
Graphics2D g2 = (Graphics2D) g;
```

```
g2.setStroke(new BasicStroke(3));
```

#### Sample Input

```
Windows PowerShell
PS C:\Users\USER\Desktop\JAVA\04 HW2Lab> java Q4
Input three point (x y):
100 300
200 500
150 222
The circumcenter of three point is (257,346)
164.210231 163.600122 163.783394
```

#### Sample Output

