ICS3U0		Semester 2, 2012 - 2013

Grade 11 Computer and Information Science
Line and Circle Drawing Test

Mr. N. Nolfi
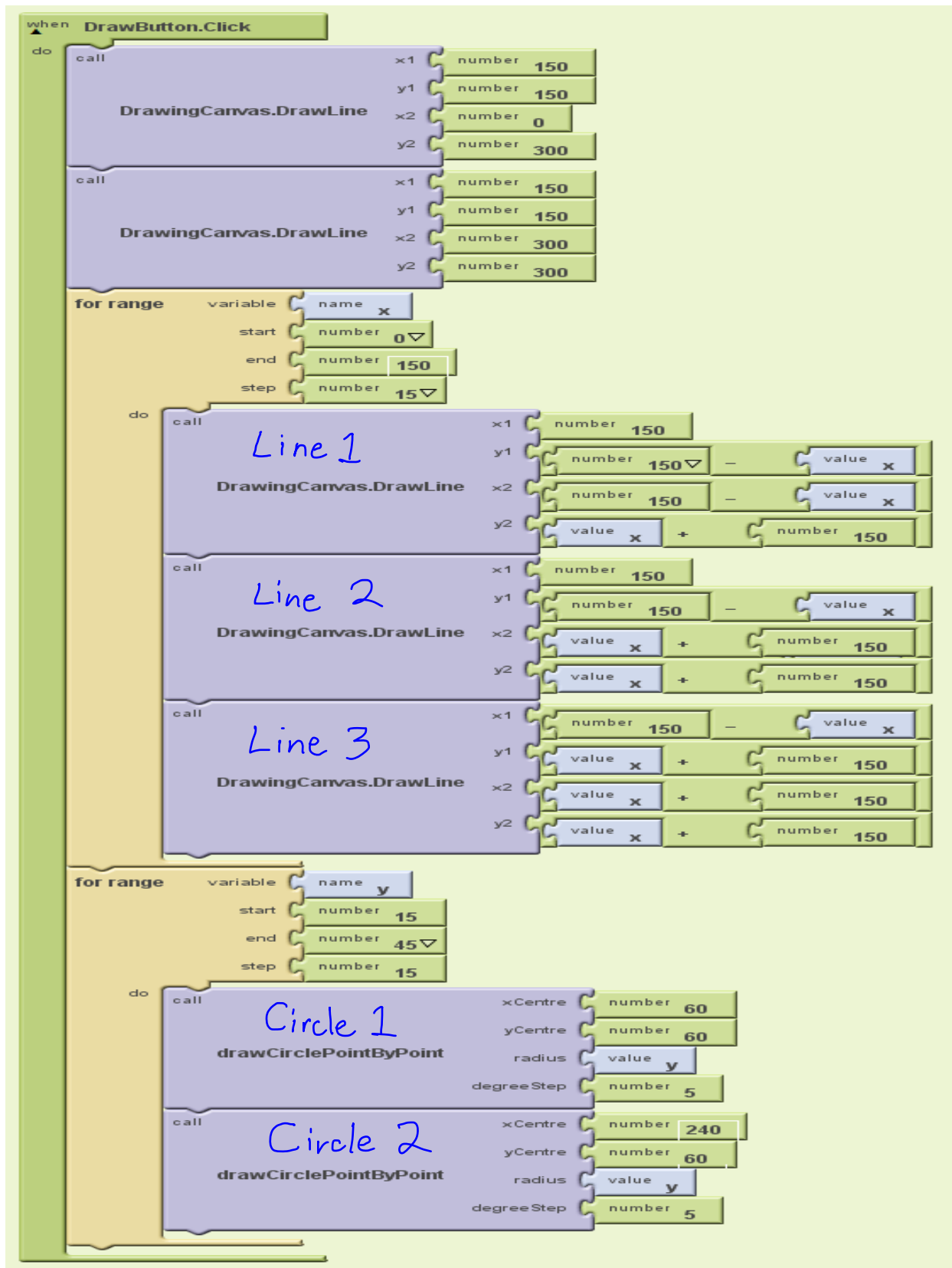*Victim:* _Mr. Solutions_   *Well done Mr. S.!!*

APP	TIPS
25 /25	**20**/20

1. Study the following program. Then answer the questions on the next page.


```
when DrawButton.Click
do  call DrawingCanvas.DrawLine
        x1  number 150
        y1  number 150
        x2  number 0
        y2  number 300

    call DrawingCanvas.DrawLine
        x1  number 150
        y1  number 150
        x2  number 300
        y2  number 300

    for range  variable  name x
        start  number 0
        end    number 150
        step   number 15
    do  call DrawingCanvas.DrawLine    Line 1
            x1  number 150
            y1  number 150 - value x
            x2  number 150 - value x
            y2  value x + number 150

        call DrawingCanvas.DrawLine    Line 2
            x1  number 150
            y1  number 150 - value x
            x2  value x + number 150
            y2  value x + number 150

        call DrawingCanvas.DrawLine    Line 3
            x1  number 150 - value x
            y1  value x + number 150
            x2  value x + number 150
            y2  value x + number 150

    for range  variable  name y
        start  number 15
        end    number 45
        step   number 15
    do  call drawCirclePointByPoint    Circle 1
            xCentre  number 60
            yCentre  number 60
            radius   value y
            degreeStep  number 5

        call drawCirclePointByPoint    Circle 2
            xCentre  number 240
            yCentre  number 60
            radius   value y
            degreeStep  number 5
```

(a) Complete the following table for the given values of x and y. **(5 APP)**

x	Line 1	Line 2	Line 3	y	Circle 1	Circle 2
	$(150, 150-x)$ to $(150-x, x+150)$	$(150, 150-x)$ to $(x+150, x+150)$	$(150-x, x+150)$ to $(x+150, x+150)$		$(60,60), y$	$(240,60), y$
0	$(150,150)$ to $(150,150)$	$(150,150)$ to $(150,150)$	$(150,150)$ to $(150,150)$	15	$(60,60)$, 15	$(240,60)$, 15
15	$(150,135)$ to $(135,165)$	$(150,135)$ to $(165,165)$	$(135,165)$ to $(165,165)$	30	$(60,60)$, 30	$(240,60)$, 30
30	$(150,120)$ to $(120,180)$	$(150,120)$ to $(180,180)$	$(120,180)$ to $(180,180)$	45	$(60,60)$, 45	$(240,60)$, 45
45	$(150,105)$ to $(105,195)$	$(150,105)$ to $(195,195)$	$(105,195)$ to $(195,195)$			

(b) Now sketch the picture that is generated by running the program on the previous page. **(15 TIPS)**

Circles 4 marks

Horizontal Lines } 4 marks

Diagonal Lines } 5 marks → except for the 2 lines drawn before entering the "for" loop

2 marks
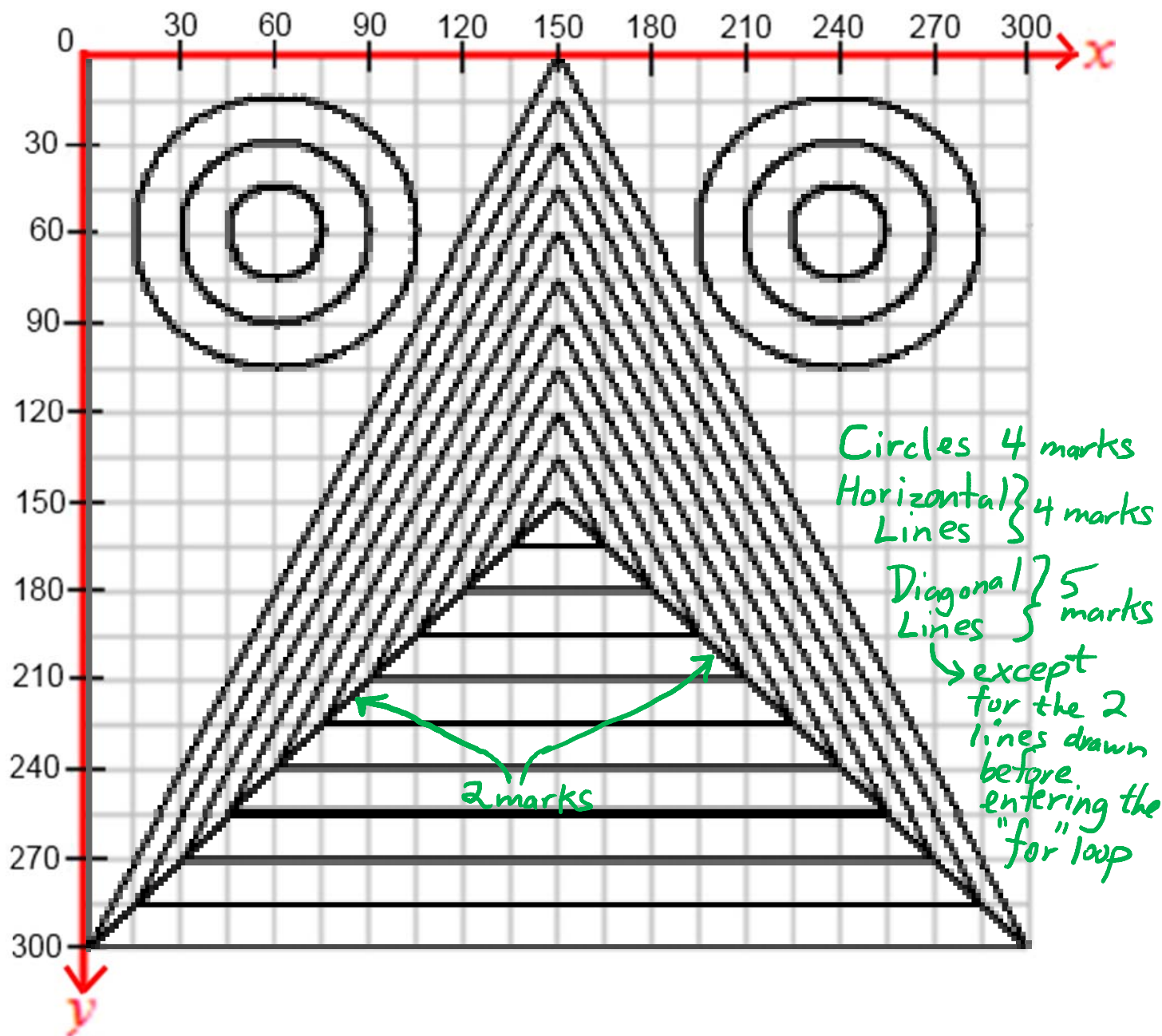
2. Study the picture shown below.

   (a) Use the grid to reproduce as much of the picture as is needed to allow you to see the patterns. **(5 TIPS)**
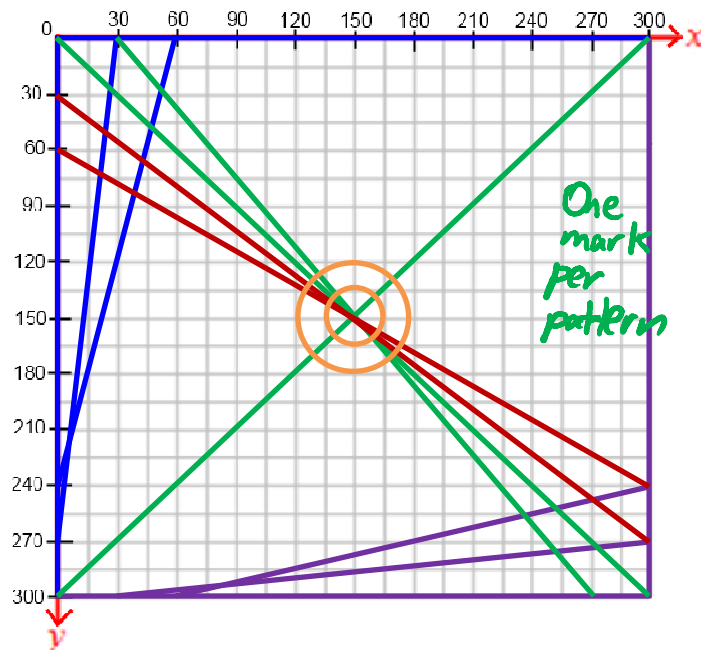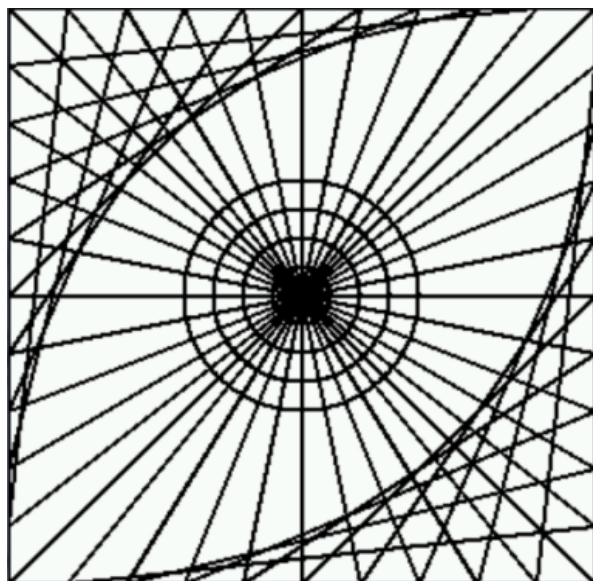
   (b) Now complete the following tables of values for the five basic patterns found in the above picture. (Pictures of the patterns are given below.) **(10 APP)**

Pattern 1 *Blue*	
Start	End
$(0,0)$	$(0,300)$
$(30,0)$	$(0,270)$
$(60,0)$	$(0,240)$
⋮	⋮
$(x,0)$	$(0,300-x)$
⋮	⋮
$(300,0)$	$(0,0)$

Pattern 2 *Purple*	
Start	End
$(0,300)$	$(300,300)$
$(30,300)$	$(300,270)$
$(60,300)$	$(300,240)$
⋮	
$(x,300)$	$(300,300-x)$
⋮	⋮
$(300,300)$	$(300,0)$

Pattern 3 *Green*	
Start	End
$(0,0)$	$(300,300)$
$(30,0)$	$(270,300)$
⋮	⋮
$(x,0)$	$(300-x,300)$
⋮	⋮
$(300,0)$	$(0,300)$

Pattern 4 *Maroon*	
Start	End
$(0,0)$	$(300,300)$
$(0,30)$	$(300,270)$
⋮	⋮
$(0,x)$	$(300,300-x)$
⋮	⋮
$(0,300)$	$(300,0)$

Pattern 5 *Orange*	
Centre	Radius
$(150,150)$	15
$(150,150)$	30
$(150,150)$	45
$(150,150)$	60
$(150,150)$	y

Pattern 1   Pattern 2   Pattern 3

Pattern 4   Pattern 5
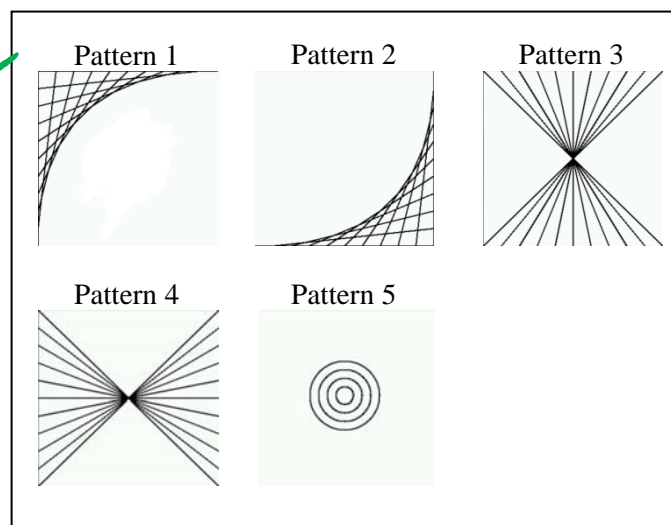
(c) Now create an App Inventor program that generates the picture on the previous page. **(10 APP)**

```
when DrawButton.Click
do
  for range    variable  name x
               start   number 0
               end     number 300
               step    number 30
    do
      call DrawingCanvas.DrawLine
           x1  number 0
           y1  value x
           x2  number 300
           y2  number 300 – value x

      call DrawingCanvas.DrawLine
           x1  number 300
           y1  value x
           x2  number 300 – value x
           y2  number 300

      call DrawingCanvas.DrawLine
           x1  value x
           y1  number 0
           x2  number 0
           y2  number 300 – value x

      call DrawingCanvas.DrawLine
           x1  value x
           y1  number 0
           x2  number 300 – value x
           y2  number 300

  for range    variable  name y
               start   number 15
               end     number 60
               step    number 15
    do
      call drawCirclePointByPoint
           xCentre     number 150
           yCentre     number 150
           radius      value y
           degreeStep  number 1
```