LAB 5: IMPLEMENTATION OF MIDPOINT ELLIPSE DRAWING ALGORITHM

Midpoint Ellipse Algorithm

Step 1: Assign Initial Values

x = 0
y = ry
rx2 = rx * rx
ry2 = ry * ry

Step 2: Input Ellipse Center and Radii

Input xc, yc, rx, ry

Step 3: Region 1 – Initialize Decision Parameter

p1 = ry2 - (rx2 * ry) + 0.25 * rx2
Plot initial 4 symmetric points

Step 4: Region 1 – Loop

```
while (2 * ry2 * x) <= (2 * rx2 * y):
    x = x + 1
    if p1 < 0:
        p1 = p1 + 2 * ry2 * x + ry2
    else:
        y = y - 1
        p1 = p1 + 2 * ry2 * x - 2 * rx2 * y + ry2
    Plot 4 symmetric points
```

Step 5: Region 2 – Initialize Decision Parameter

p2 = (ry2 * (x + 0.5)^2) + (rx2 * (y - 1)^2) - (rx2 * ry2)

Step 6: Region 2 – Loop

```
while y >= 0:
    if p2 > 0:
        y = y - 1
        p2 = p2 - 2 * rx2 * y + rx2
    else:
        x = x + 1
        y = y - 1
        p2 = p2 + 2 * ry2 * x - 2 * rx2 * y + rx2
    Plot 4 symmetric points
```

Step 7: Repeat

Repeat steps 6 until y < 0; ellipse is complete