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Section: 2

Course: CSE322.2

Experiment: Mid-Point Ellipse

Lab report: 4

Source Code:

```
#include<windows.h>
#include<GL/glut.h>
#include<stdlib.h>
#include<stdio.h>
float h, k, a, b;
void display(void) {
  glBegin(GL_POINTS);

  float x = 0, y = b;
  float fx = 0, fy = 2 * a * a *b;
  float p = (b * b) - (a * a * b) + (0.25 * a * a);

  while(fx < fy) {
    glVertex2f(h + x, k + y);
    glVertex2f(h - x, k + y);
    glVertex2f(h - x, k - y);
    glVertex2f(h + x, k - y);

    if(p < 0){
      fx = fx+2*b*b;
      p = p+fx+b*b;
      x++;
    }
    if(p >= 0){
```

```
      fx=fx+2*b*b;
      x++;
      y--;
      fy=fy-2*a*a;
      p=p+fx+b*b-fy;
   }
}

// decision parametre for second region
p= (b*b) * (x+.5) * (x+.5) +( a*a) * (y-1) * (y-1) - (a*a) * (b*b);

while(y >= 0){
   glVertex2f(h + x, k + y);
    glVertex2f(h - x, k + y);
    glVertex2f(h - x, k - y);
    glVertex2f(h + x, k - y);

   if(p >= 0){
      y--;
      fy=fy-2*a*a;
      p=p-fy+a*a;
   }
   if(p < 0){
      y--;
      x++;
      fy=fy-2*a*a;
```

```
        fx=fx+2*b*b;
        p=p+fx-fy+a*a;
      }

}

   glEnd();
   glFlush();
}
void init(void) {
   glClear(GL_COLOR_BUFFER_BIT);
   glClearColor(0,0,0,0);
   glMatrixMode(GL_PROJECTION);
   glLoadIdentity();
   gluOrtho2D(-100,100,-100,100);
}
int main(int argc, char** argv)
{
   printf("Enter the Center Points: \n");
   scanf("%f %f", &h,&k);
   printf("Enter Major axis and Minor axis: \n");
   scanf("%f %f", &a, &b);
   glutInit(&argc, argv);
   glutInitDisplayMode(GLUT_SINGLE | GLUT_RGB);
   glutInitWindowSize(500,500);
   glutInitWindowPosition(100,100);
```

```
    glutCreateWindow("___");
    init();
    glutDisplayFunc(display);
    glutMainLoop();
   return 0;
}
```

Input and Output: