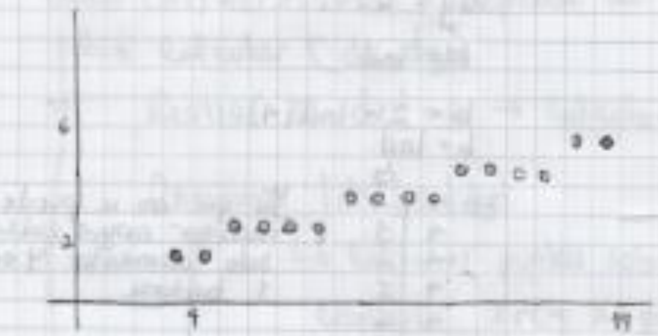
```
// PRESENTADO POR JOAN SEBASTIAN TIBAQUIRA COD 1202060
#include <iostream>
#include <GL/glut.h>
#include <math.h>
using namespace std;
int W = 800, H = 600;
int X1, X2, Y1, Y2;
double m, b, dx, dy, x, y;
int s, f, a;

void Display() {
        glClear(GL_COLOR_BUFFER_BIT);
        glFlush();
}
void Start() {
        gluOrtho2D(0, W, H, 0);
        glClearColor(0, 0, 0, 0);
}
void Pixel(int X, int Y) {
        glPointSize(5);//ADECUA EL TAMAÑO DEL PIXEL
        glColor3f(1, 0, 0);
        glBegin(GL_POINTS);
        glVertex2f(X, Y);
        glEnd();
        glFlush();
}
void Line(int x1, int y1, int x2, int y2) {
        dx = x2 - x1;
        dy = y2 - y1;
        m = dy / dx;
    b = y1 - (m * x1);
        if (dx == 0) {
                if (y1 >= y2) {
                        s = y2;
                        f = y1;
                }
                else {
                        s = y1;
                        f = y2;
                }
                for (int i = s; i <= f; i++) {
                        Pixel(x, i);
                }
        }
        else
        {
                if (m == 0) {
                        if (x1 >= x2) {
                                s = x2;
                                f = x1;
                        }
                        else {
                                s = x1;
                                f = x2;
                        }
                        for (int i = s; i <= f; i++) {
                                Pixel(i, y1);
                        }
                }
                else {
                        if (abs(dx) >= abs(dy)) {
                                if (x1 >= x2) {
                                    s = x2;
                                    f = x1;
                                }
                                else {
                                    s = x1;
                                    f = x2;
                                }
                                for (int j = s; j <= f; j++) {
                                    y = (m * j) + b;
                                    Pixel(j, y);
                                }
                        }
                        else {
                                if (y1 >= y2) {
                                    s = y2;
                                    f = y1;
                                }
                                else {
                                    s = y1;
                                    f = y2;
                                }
                                for (int i = s; i <= f; i++) {
                                    a = i - b;
                                    x = a / m;
                                    Pixel(x, i);
                                }
                        }
                }
        }
}

void Mouse(int B, int S, int X, int Y) {

        if ((S == GLUT_DOWN) && (B == GLUT_LEFT_BUTTON)) {
                X1 = X;
                Y1 = Y;
                Pixel(X1, Y1);
        }
        if ((S == GLUT_DOWN) && (B == GLUT_RIGHT_BUTTON)) {
                X2 = X;
                Y2 = Y;
                Pixel(X2, Y2);
                Line(X1, Y1, X2, Y2);
        }
}

int main(int argc, char* argv[]) {
        glutInit(&argc, argv);
        glutInitDisplayMode(GLUT_RGBA | GLUT_SINGLE);
        glutInitWindowPosition(650, 50);
        glutInitWindowSize(W, H);
        glutCreateWindow("LINE");
        Start();
        glutDisplayFunc(Display);
```

```
        glutMouseFunc(Mouse);
        glutMainLoop();
}
```

Pseudocodigo #1



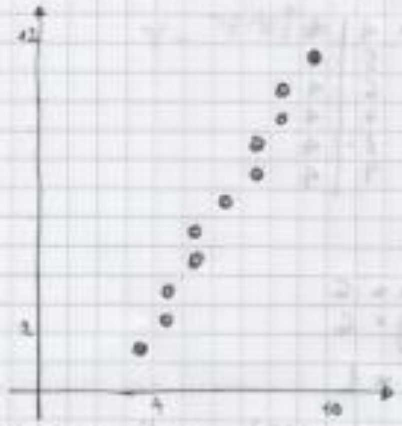
$m = dy/dx$

$dx = 15$
$dy = 4$

$m = 0.26$

	y		y		y
x = 4	2	11	3.82	18	5.64
5	2.26	12	4.08	19	5.90
6	2.52	13	4.34		
7	2.78	14	4.60		
8	3.04	15	4.86		
9	3.30	16	5.12		
10	3.56	17	5.38		

Pseudocodigo #2



$m = dy/dx$

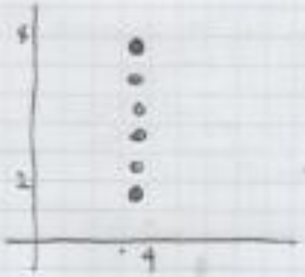
$dx = 6$
$dy = 10$

$b = -4.4$

$m = \frac{10}{6} = 1.\overline{6}$

	x
y = 2	4
3	4.59
4	5.18
5	5.78
6	6.38
7	6.98
8	7.58
9	8.19
10	8.79
11	9.39
12	10

Pseudocodigo # 3



dx = 0
dy = 6

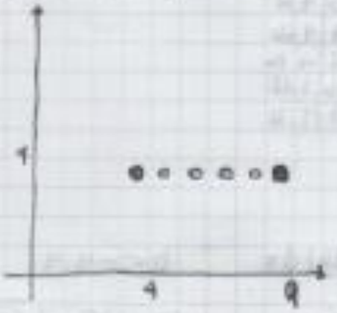
m = Ind

b = 2 - Ind(4)
b = Ind.

x =	y
4	2
4	3
4	4
4	5
4	6
4	7
4	8

Ya que no se puede realizar ningun calculo solo aumentar y en 1 butura.

Pseudo codigo # 4



dx = 5
dy = 0

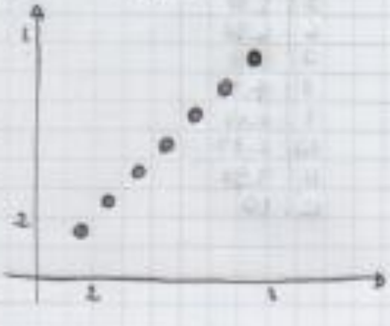
m = 0

b = 4 - (0)4
b = 4

$x = \frac{(y-b)}{m}$

x =	
4	4
5	4
6	4
7	4
8	4
9	4

Pseudocodigo # 5



dx = 6
dy = 6

m = 1

b = 2 - 1(2)
b = 0

y = mx + b

x =	y		y
2	2	6	6
3	3	7	7
4	4	8	8
5	5		

Pseudocodigo base

```
Linea ($x_1, x_2, y_1, y_2$) → depende de pinta pixel
  ↳ Calcular ($dx, dy$)
      Revisar si $dx != 0$ → Calcular $m, b$ $\begin{cases} m = dy/dx \\ b = y - mx \end{cases}$
      Comparar $|dx| \geq |dy|$
          ↳ Calcular puntos sobre $x$
              Comparar $x_1$ y $x_2$ para saber donde
                  empezar
                  $y = mx + b$
          ↳ Sino Calcular puntos sobre $y$
              Comparar $y_1$ y $y_2$ para saber donde
                  empezar
                  $x = y - b / m$
  ↳ Calcular puntos sobre $y$
      $x = y - b / m$.
```