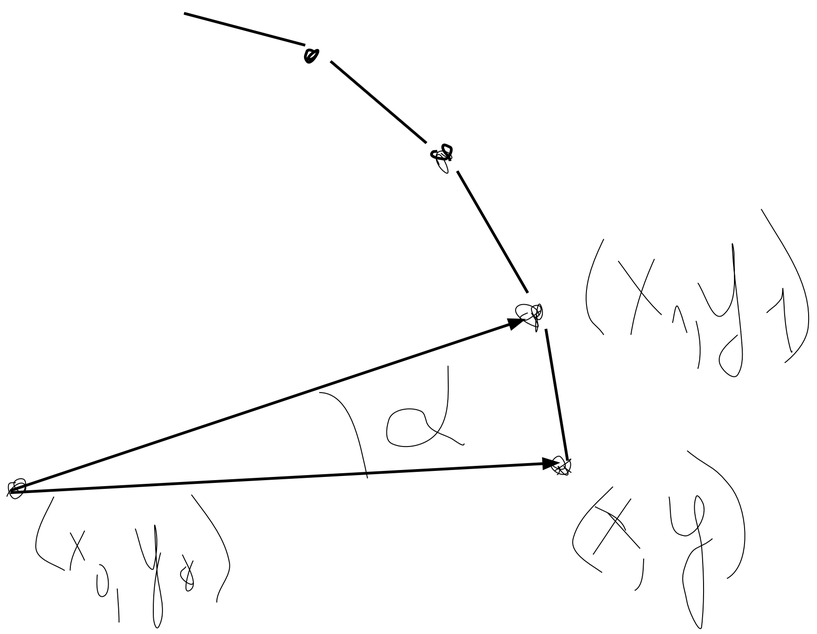
x1=(x-x0)cosa + (y-y0)sina + x0
y1=-(x-x0)sina + (y-y0)cosa + y0



при повороте вокруг точки

$O(x_0; y_0)$

```
void paint_spiral_vectorom(double dlina, double ugol, struct point shade, int shag)
{
   double param = 100;
   double a = dlina * cos(ugol);
   double b = dlina * sin(ugol);
   double c = 1 * cos(0);
   double d = 1 * sin(0);
   double c1, d1;

   for(int i = 0; i < shag; i++)
   {
      c1 = a * c - b * d;
      d1 = b * c + a * d;
      paint_vector_segment(c * param + WIDTH / 2, d * param + WIDTH / 2, c1 * param + WIDTH / 2, d1 * param + WIDTH / 2, shade);
      c = c1;
      d = d1;
   }
}
```

```
void paint_round(double radius, double ugol, point shade, int shag, int x0, int y0)
{
   int x = x0 + radius;
   int y = y0;
   int x1, y1;
   for(int i = 0; i < shag; i++)
   {
      x1 =(x - x0) * cos(ugol) + (y - y0) * sin(ugol) + x0;          ///x1=(x-x0)cosa + (y-y0)sina + x0
      y1 = - (x - x0) * sin(ugol) + (y - y0)* cos(ugol) + y0;       ///y1=-(x-x0)sina + (y-y0)cosa + y0
      paint_vector_segment(x, y, x1, y1, shade);
      x = x1;
      y = y1;
   }
```

WIN32 API
MAC OS API
LINUX API
Android API
IOS API

SKYPE 2007
skype mac os 2011
skype linux 2015

Google chrome 2010
chromium - движок
Yandex 2013

javascript

browser

программные среды
QT creator