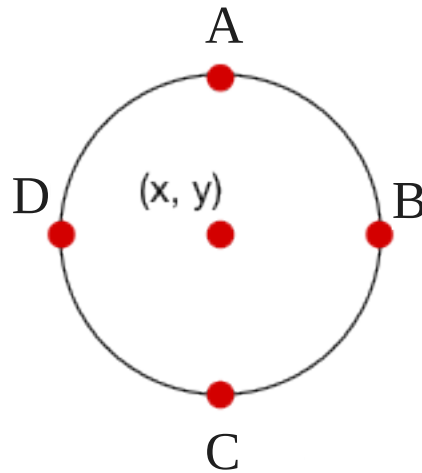


These questions similar to those that might appear on a CMPT 166 midterm or final.

Points on a Circle

(4 marks) Suppose the following circle is drawn on the Processing screen. It has center (x, y) and radius 5.

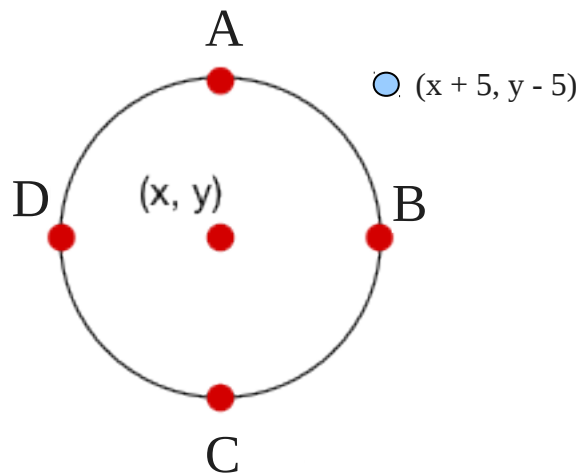


1. What are the coordinates of the points A, B, C, and D?

Solution

$$\begin{aligned}A &= (x, y - 5) \\B &= (x + 5, y) \\C &= (x, y + 5) \\D &= (x - 5, y)\end{aligned}$$

2. Where would the point $(x + 5, y - 5)$ be? Draw it (clearly!) on the diagram.



Debugging

(10 marks) The following function is *supposed* to test if the point (x, y) is in the circle whose center is (a, b) and radius is r . However, it has **at least 5 errors**. Circle all the errors and show how to fix them.

The program is double-spaced to make it easier for you to write your answers.

```
Boolean pointInCircle(float x, float y,  
  
                    float a, float b  
  
                    float r  
  
{  
  
    if dist(x, y, a, b) <= r {  
        return false;  
    } else  
        return true;  
  
}
```

Solution

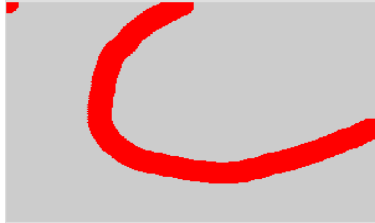
- “Boolean” should be “boolean”
- missing “,” after “float b”
- missing “)” after “float r”
- missing “(“ and “)” around “dist(x, y, a, b) <= r”
- “return false” and “return true” are in the wrong places and should be swapped

Note that the absence of “{“ and “}” around “return true;” is *not* an error: Processing lets you leave out the braces in an if-statement body if it is a single statement.

Painting

(5 marks) Write a complete Processing program that lets the user draw screen a red circle of radius 10 (centered at the mouse pointer). The edge of the circle should be red, and the screen should be 300 pixels wide and 200 pixels high.

Here's an example of what the screen might look like after the user tries to draw a "C" shape:



Solution

```
void setup() {  
  size(300, 200);  
}
```

```
void draw() {  
  fill(255, 0, 0);  
  noStroke();  
  ellipse(mouseX, mouseY, 20, 20);  
}
```