

# COSC 4370 - Homework 1

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## 1 Problem

In this assignment, you will be implementing an algorithm for rasterizing an ellipse. You will rasterize the ellipse  $(x/12)^2 + (y/6)^2 = 64^2$  where  $x \geq 0$ .

## 2 Method

From the given code I altered the main function based off of the ellipse formula we were given in the initial problem. Since the problem asked to rasterize the ellipse where  $x \geq 0$  I began to make adjustments to the formula so that we could see the whole positive side of the ellipse. This required the movement of the ellipse on the Y-axis because the ellipse needed to move out of the negative y area, thus we can see the entire positive x side on the output file. Once the ellipse was moved up I was able to go through and place all points on the positive x-axis, and that gave the output of the whole positive x-axis ellipse, i.e the right half of the full ellipse.

## 3 Implementation

Given the ellipse formula I moved the ellipse up by 384 pixels so the entire ellipse would be in the positive Y zone. Since the region we are working in is all positive values this was necessary to see all the positive x-value points. I then started by breaking down the formula from the initial problem to get all the corresponding y-values to each x-value. With me moving up the ellipse to be in the entire positive y region this meant that every x value would have 2 corresponding y-values. To fix this issue when I would go to set the pixels I would subtract the distance from the y-value to the center and then multiply that distance by 2. This would give me the second y-value that corresponded to the initial x-value, which would be on the bottom half of the ellipse.

## 4 Results

The output of the program was a .bmp file which when viewed you will see the right half, or the positive x side of the ellipse.