

### 1. Objective

The objective of this assignment was to rasterize the given formula for an ellipse:

$$(x/12)^2 + (y/6)^2 = 64^2 \text{ where } y \geq 0$$

### 2. Method

My method was to first solve for y. This resulted in:

$$y = \sqrt{64^2 - \left(\frac{x}{12}\right)^2} \cdot 6$$

Using the formula for y, I was able to iterate through x and map the values of y.

### 3. Implementation

I iterated through the x values of the ellipse's horizontal diameter using a for-loop.  $D_x = 1536$ . Starting x at -768 and increasing to 768, I considered the pixel translations when using the set\_pixel function for BMP by adding half the size of the bitmap. This correctly displays the upper half of the ellipse with the origin in the center of the bitmap.

### 4. Results

My solution was very simple, but I do not believe it's the correct solution to the problem asked. Rasterization requires every pixel to "touch" along the whole shape, but I was unable to fully determine how to achieve that.

Within my code submission there is a commented section of code that was taken from the textbook that I tried to modify many times to form it to this problem. The given code is specifically for an eighth of a circle, then should be repeated eight times to form the full rasterized circle.

Essentially, the true way to solve it is to go along the vector and set the pixels with the nearest center-point to 1.