21BDS0340

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# Digital Lab Assignment 2

## Problem 1

The region bounded by the parabola x2 = y and the line y = x in the first quadrant is rotated about the X-axis to generate a solid. Find the volume of the solid.

### Code:

syms x

f = x^2;

g = x;

lower\_limit = 0;

upper\_limit = 1;

volume = int(pi \* (g - f)^2, x, lower\_limit, upper\_limit)

h = matlabFunction(g - f);

x\_values = linspace(lower\_limit, upper\_limit, 100);

[X, Y, Z] = cylinder(h(x\_values));

Z = lower\_limit + Z.\*(upper\_limit - lower\_limit);

surf(X, Y, Z)

xlabel("x")

ylabel("y")

zlabel("z")

### Text Description automatically generated with medium confidenceOutput:

Chart

Description automatically generated

## Problem 2:

Find the volume generated by rotating about the line y = 1, the regions bounded by the curve y = √x ,the line y = 1 and x = 3.

### Code:

syms x

f = sqrt(x);

lower\_limit = 1;

upper\_limit = 3;

h = matlabFunction(f - 1);

x\_values = linspace(lower\_limit, upper\_limit, 100);

[X, Y, Z] = cylinder(h(x\_values));

surf(X, Y, Z)

xlabel("x")

ylabel("y")

zlabel("z")

Chart, surface chart

Description automatically generated

### Output: