21BDS0340

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Course Code: BMAT101L

Course Number: VL2021220106765

Course Slot: L9, L10

Digital Lab Assignment 2

Problem 1

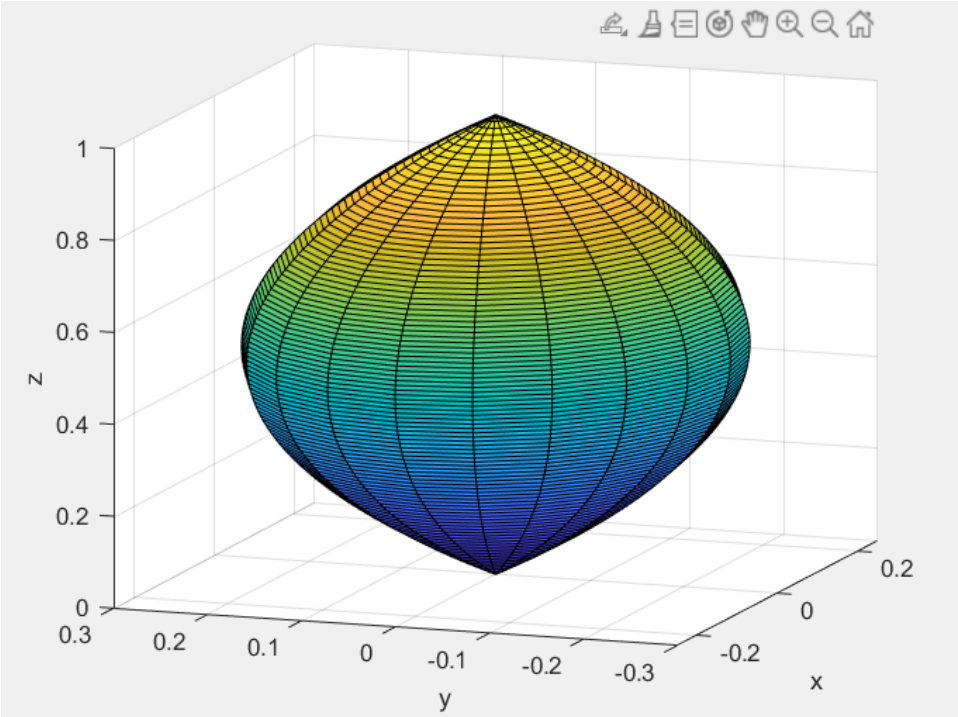
The region bounded by the parabola $x^2 = y$ and the line $y = x$ in the first quadrant is rotated about the X-axis to generate a solid. Find the volume of the solid.

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")
```

Output:

```
>> Question1

volume =

pi/30
```



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")
```

Output: