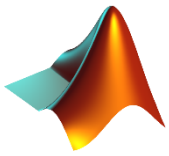
MAT 1011

MATLAB



Digital Assignment – 4

L31+L32

FALL SEMESTER 2019-20

by

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Question 1

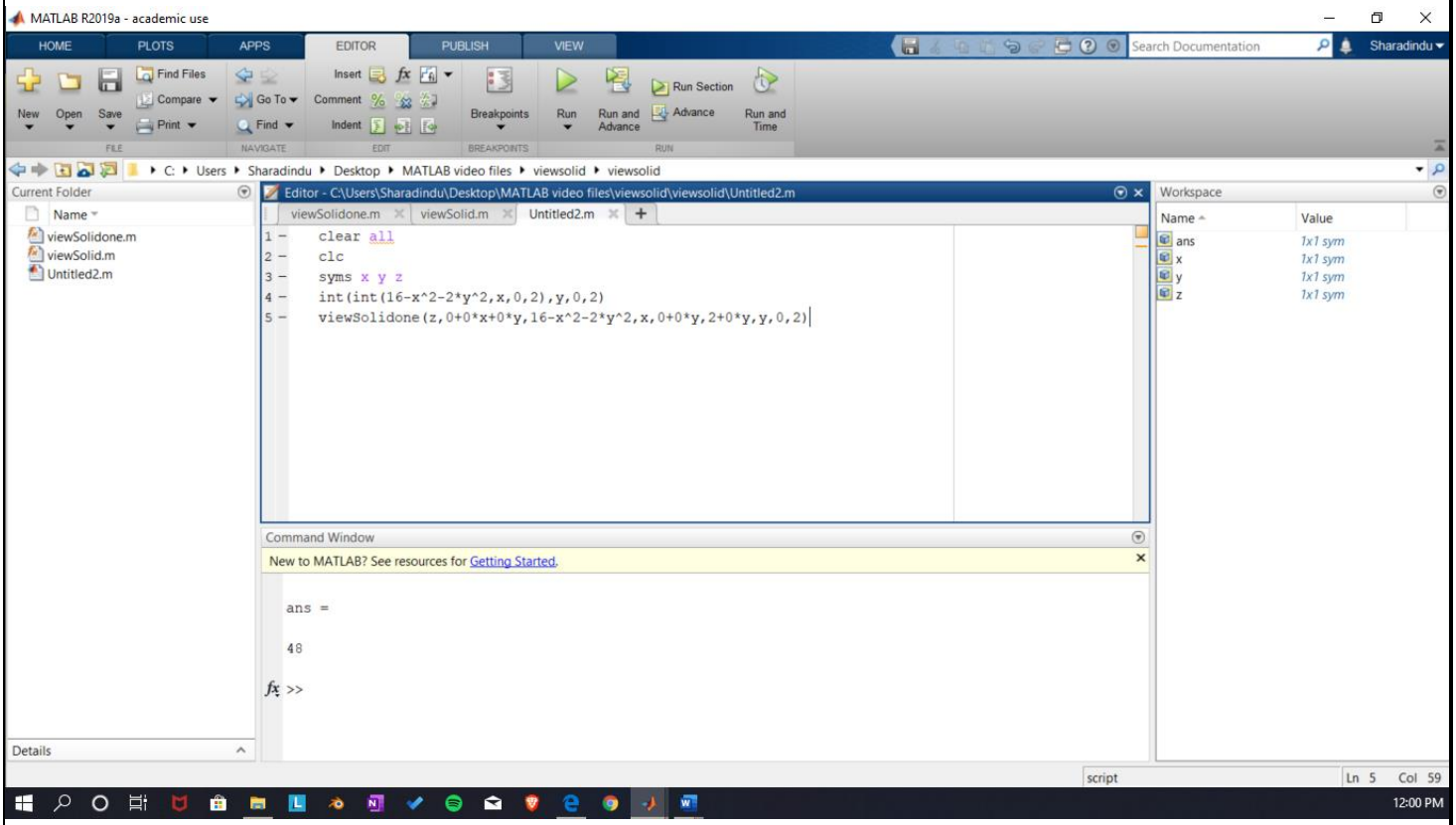
Problem:

Find the volume of the solid S that is bounded by the elliptic paraboloid $x^2 + 2y^2 + z = 16$, the planes $x = 2$ and $y = 2$, and the three coordinate planes.

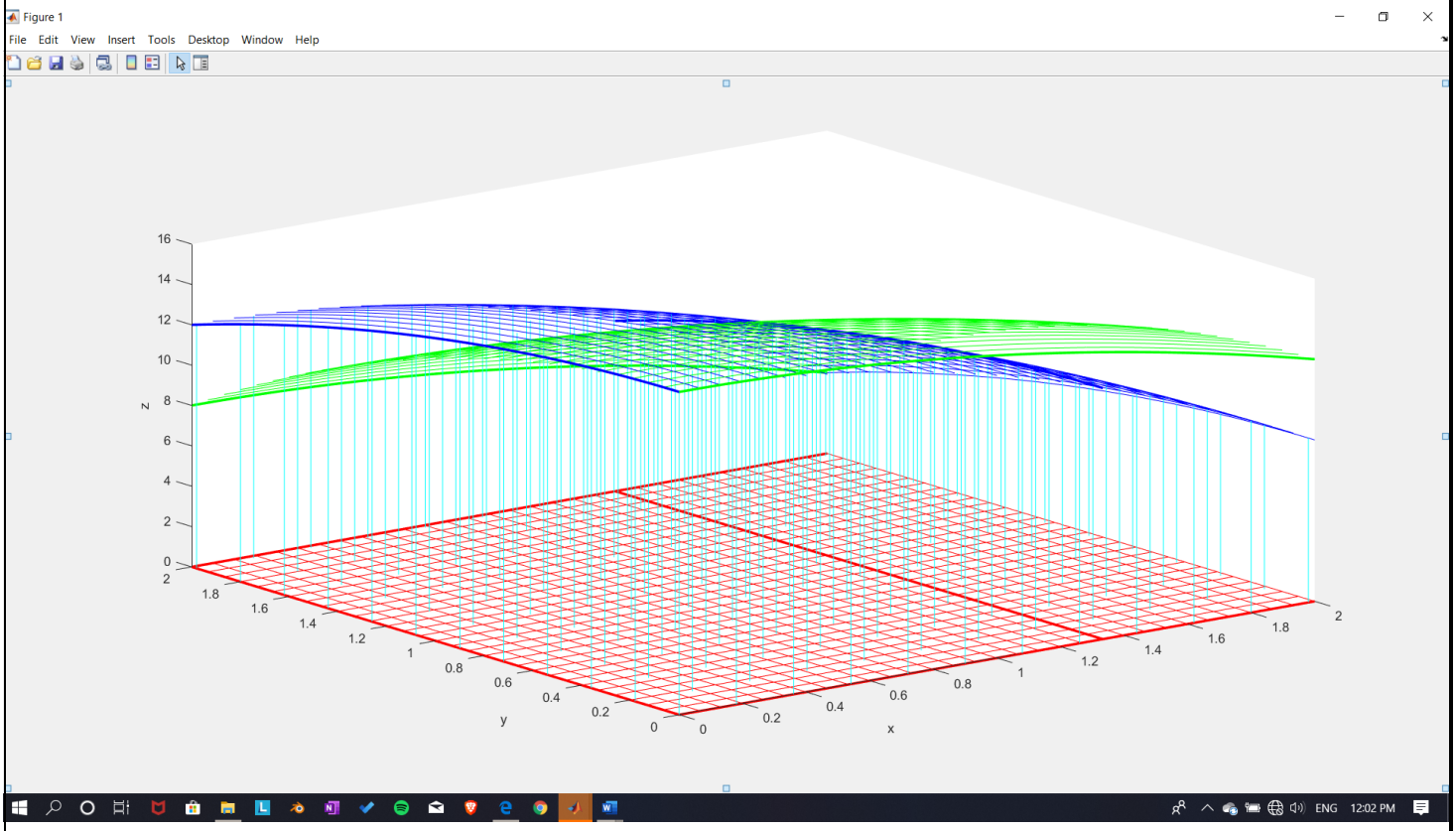
Code & Input:

```
clear all
clc
syms x y z
int(int(16-x^2-2*y^2,x,0,2),y,0,2)
viewSolidone(z,0+0*x+0*y,16-x^2-2*y^2,x,0+0*y,2+0*y,y,0,2)
```

Screenshot of Code:



Output & Graph:



Question 2

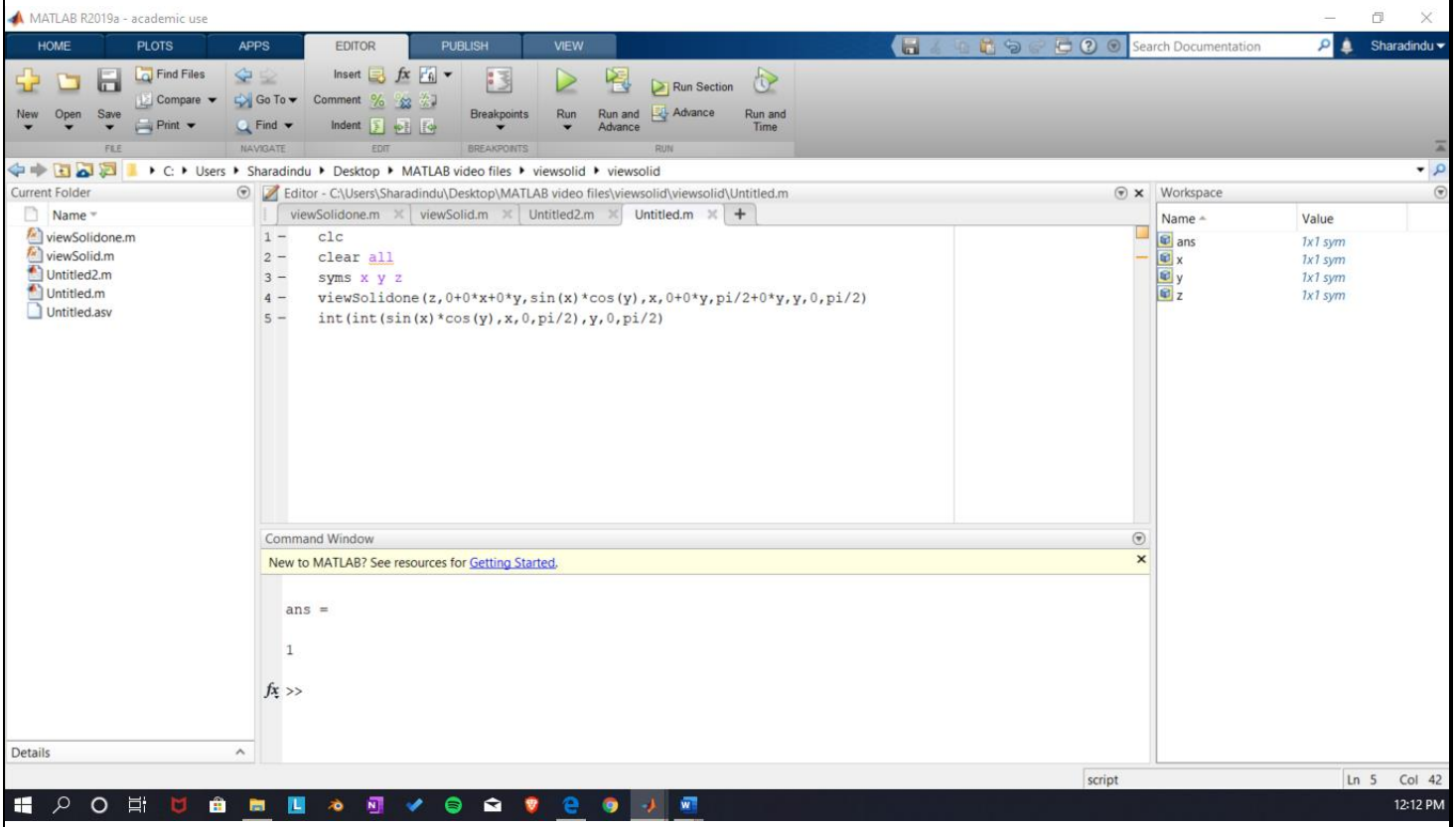
Problem:

Evaluate $\iint_R \sin x \cos y \, dA$ where $R = [0, \pi/2] \times [0, \pi/2]$.

Code & Input:

```
clc
clear all
syms x y z
viewSolidone(z,0+0*x+0*y,sin(x)*cos(y),x,0+0*y,pi/2+0*y,y,0,pi/2)
int(int(sin(x)*cos(y),x,0,pi/2),y,0,pi/2)
```

Screenshot of Code:

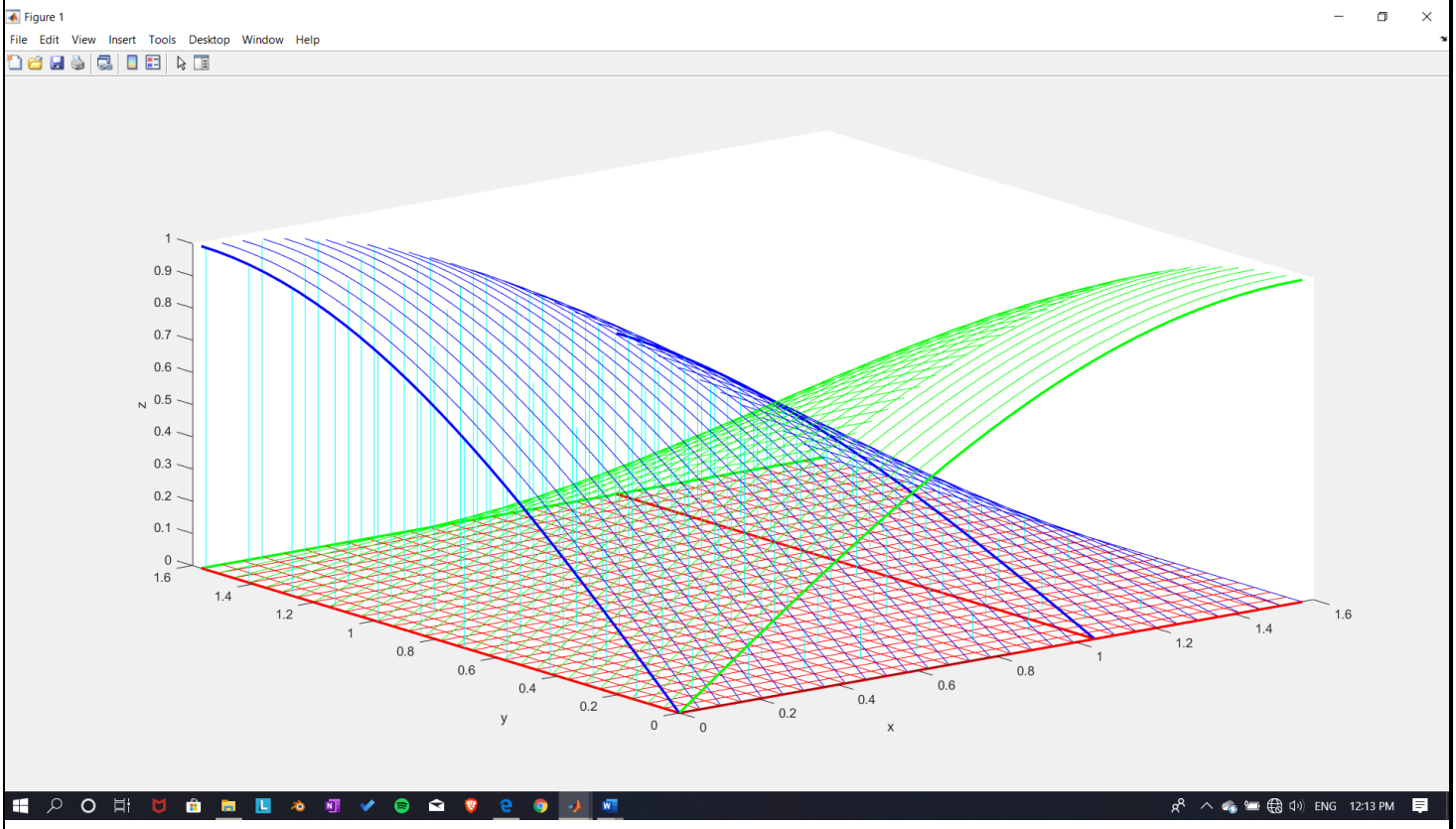


Output

```
ans =

1
```

Graph:



Question 3

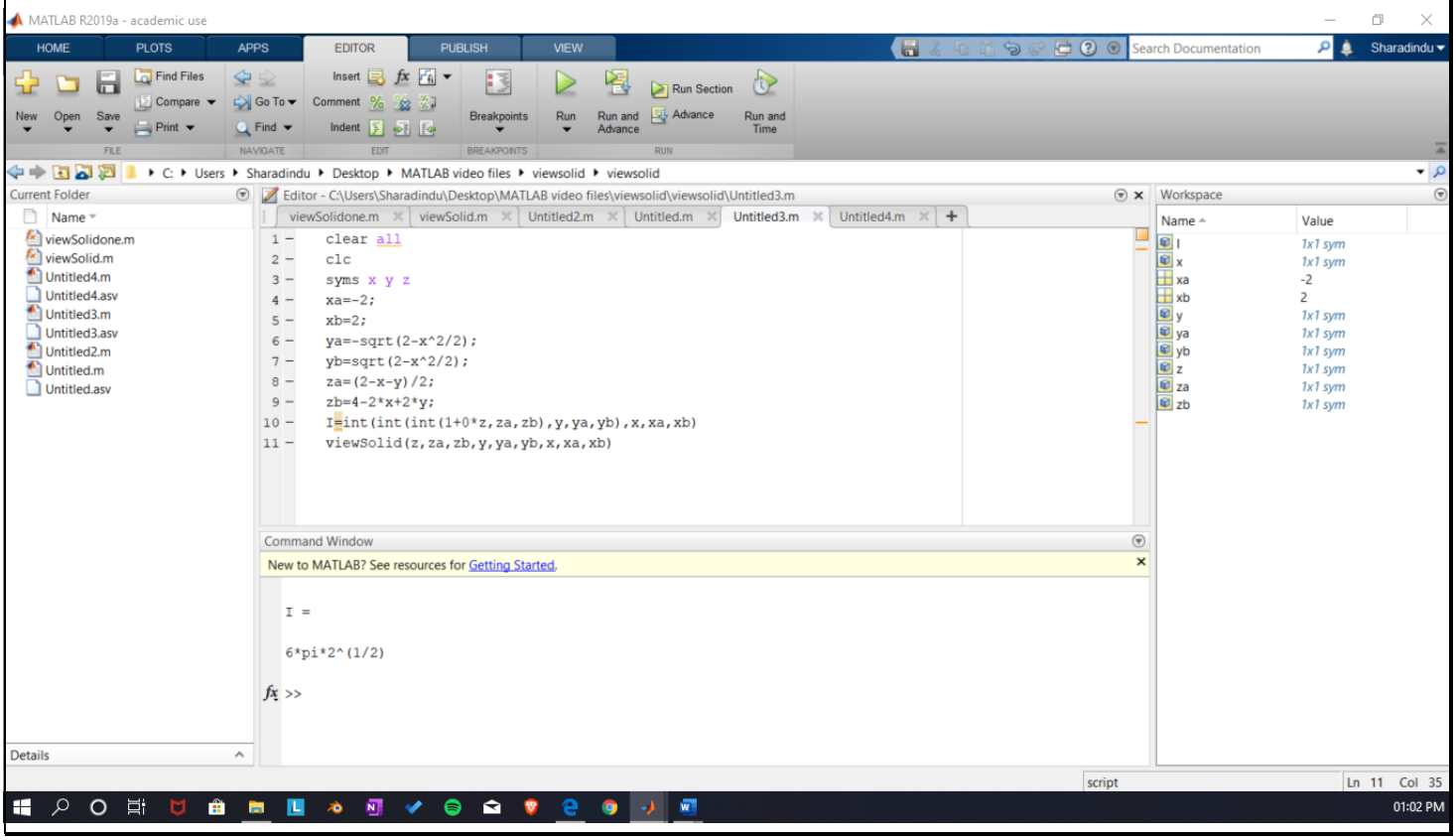
Problem:

Find the volume of the region bounded between the planes $x + y + 2z = 2$ and $2x + 2y + z = 4$ in the first octant.

Code & Input:

```
clear all
clc
syms x y z
xa=-2;
xb=2;
ya=-sqrt(2-x^2/2);
yb=sqrt(2-x^2/2);
za=(2-x-y)/2;
zb=4-2*x+2*y;
I=int(int(int(1+0*z,za,zb),y,ya,yb),x,xa,xb)
viewSolid(z,za,zb,y,ya,yb,x,xa,xb)
```

Screenshot of Code:

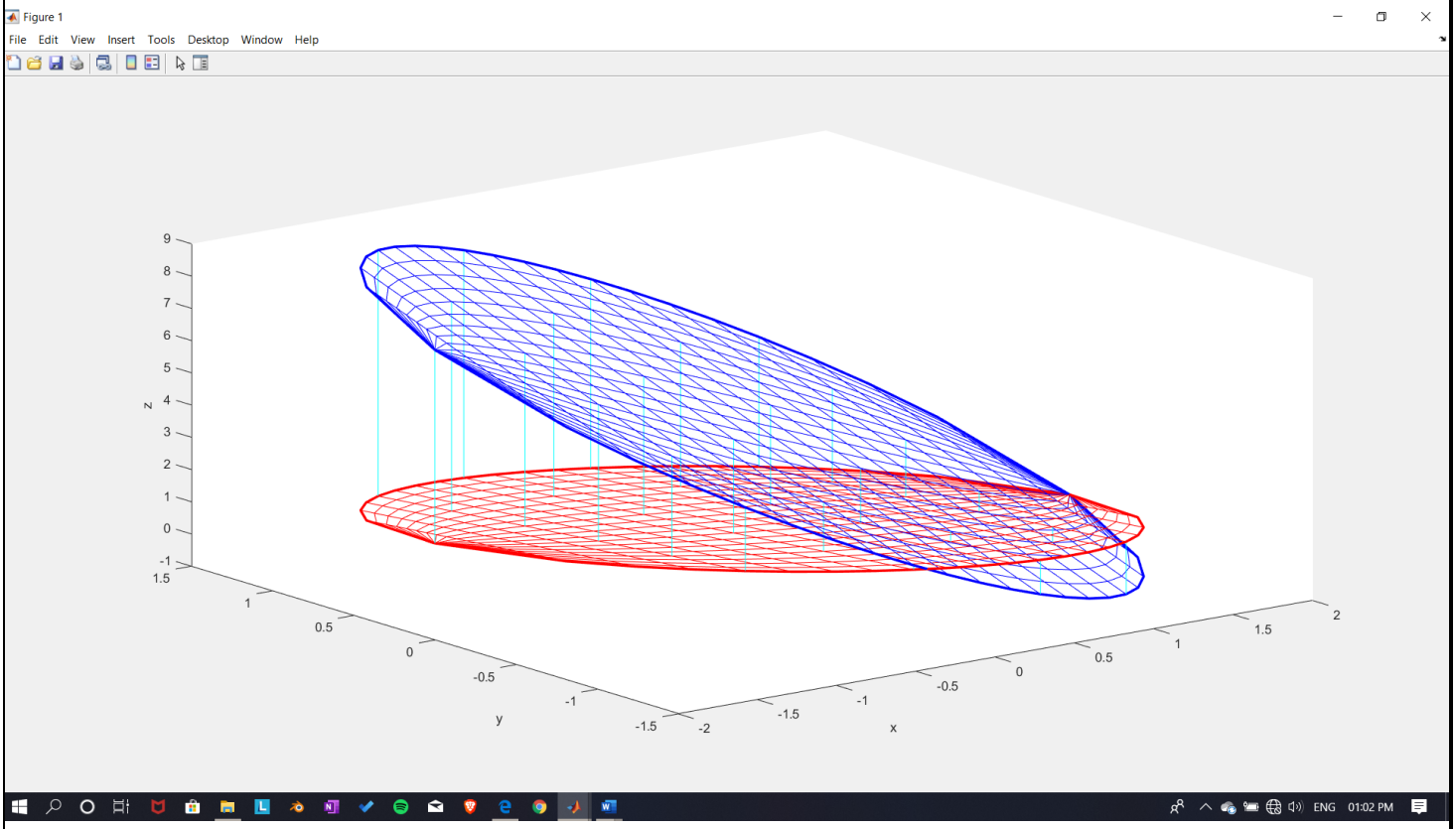


Output:

```
I =

6*pi*2^(1/2)
```

Graph:



Question 4

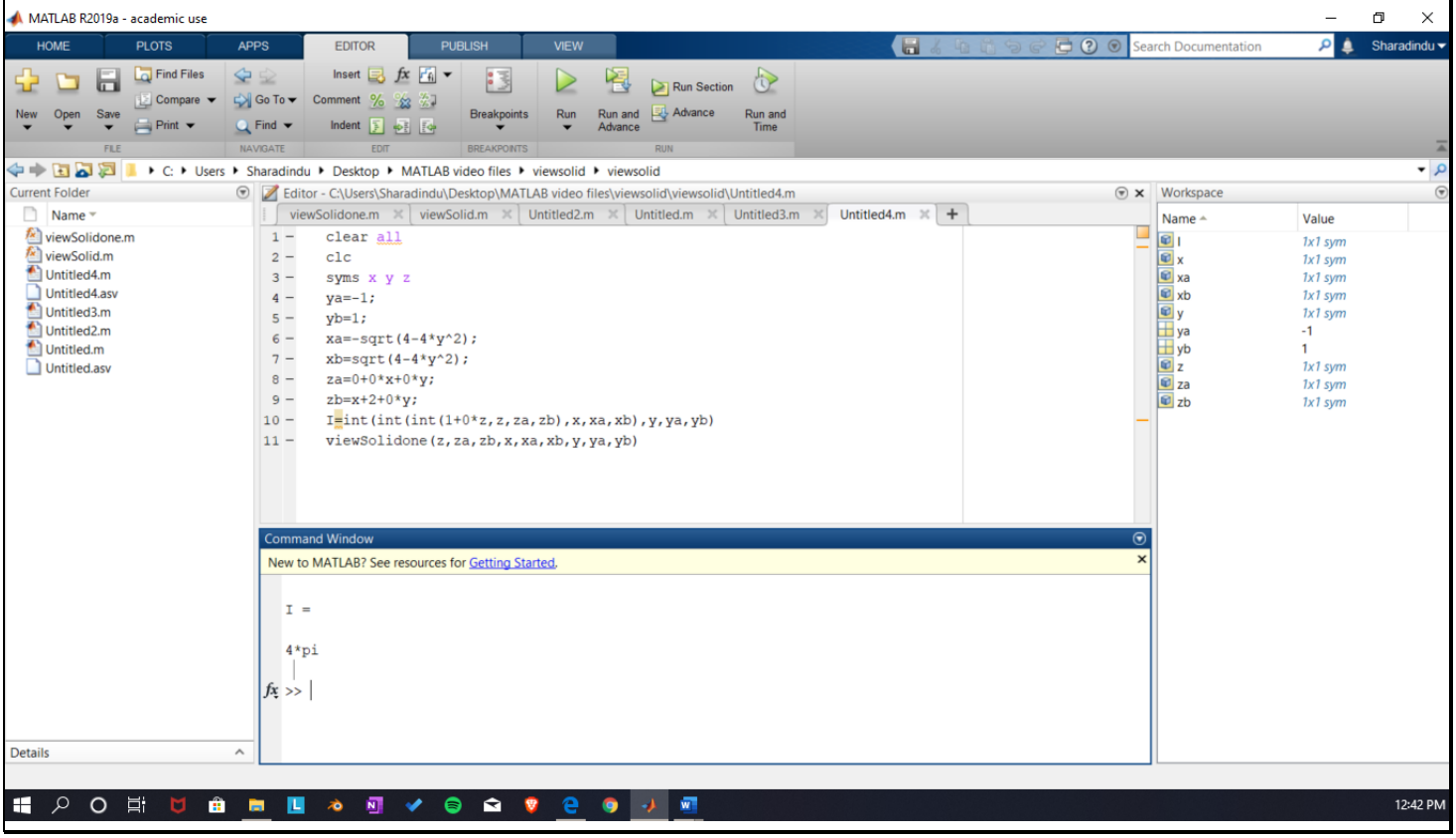
Problem:

Find the volume of the region cut from the solid elliptical cylinder $x^2 + 4y^2 \leq 4$ by the xy – plane and the plane $z = x + 2$.

Code & Input:

```
clear all
clc
syms x y z
ya=-1;
yb=1;
xa=-sqrt(4-4*y^2);
xb=sqrt(4-4*y^2);
za=0+0*x+0*y;
zb=x+2+0*y;
I=int(int(int(1+0*z,z,za,zb),x,xa,xb),y,ya,yb)
viewSolidone(z,za,zb,x,xa,xb,y,ya,yb)
```

Screenshot of Code:

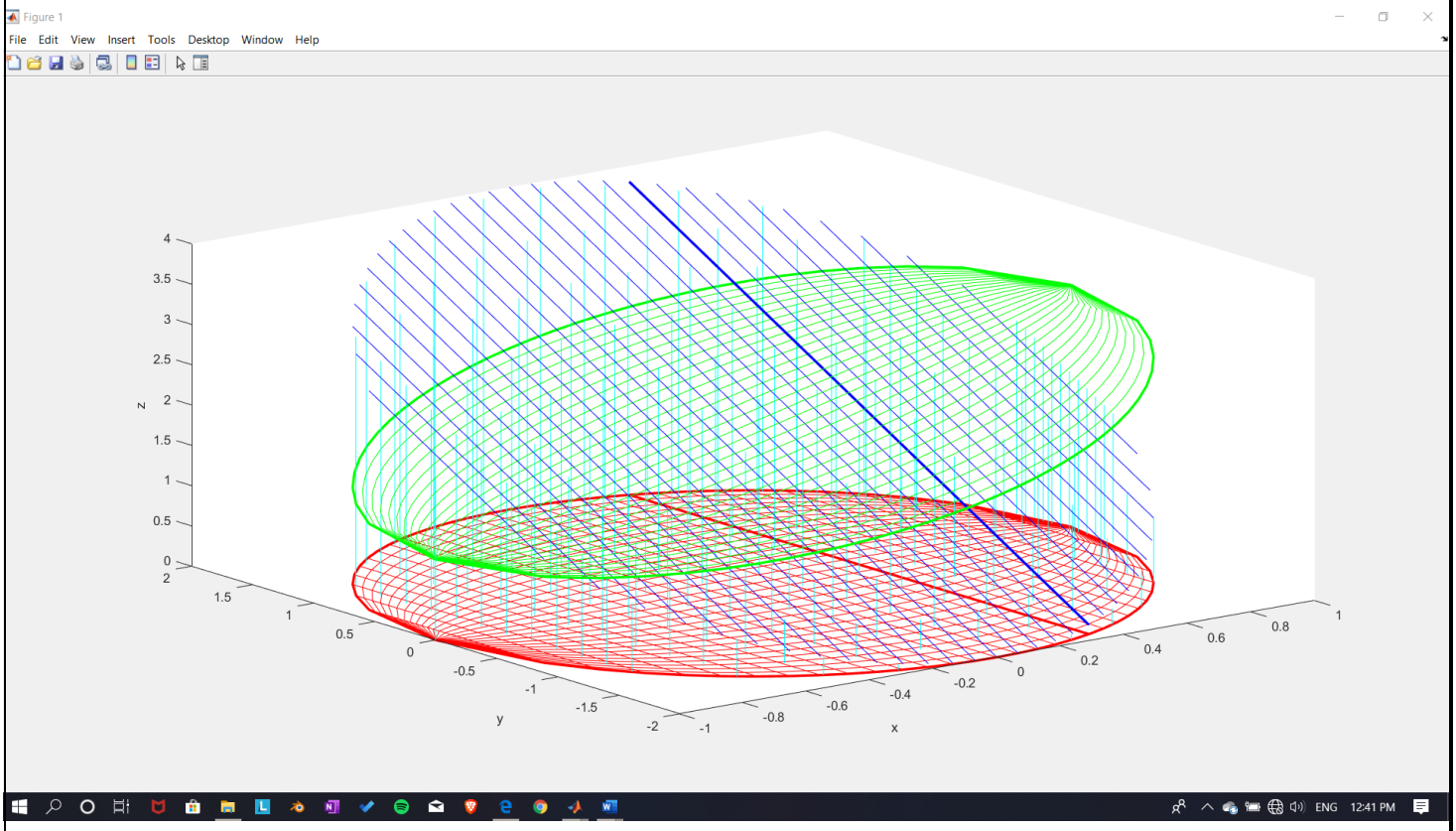


Output:

```
I =

4*pi
```

Graph:



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