MATLAB-EXPERIMENT-4A

Double Integrals and change of order of integration

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MAT 1011 – Calculus for Engineers (MATLAB)

Experiment 4-A

Double Integrals and change of order of integration

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Question 1:

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.

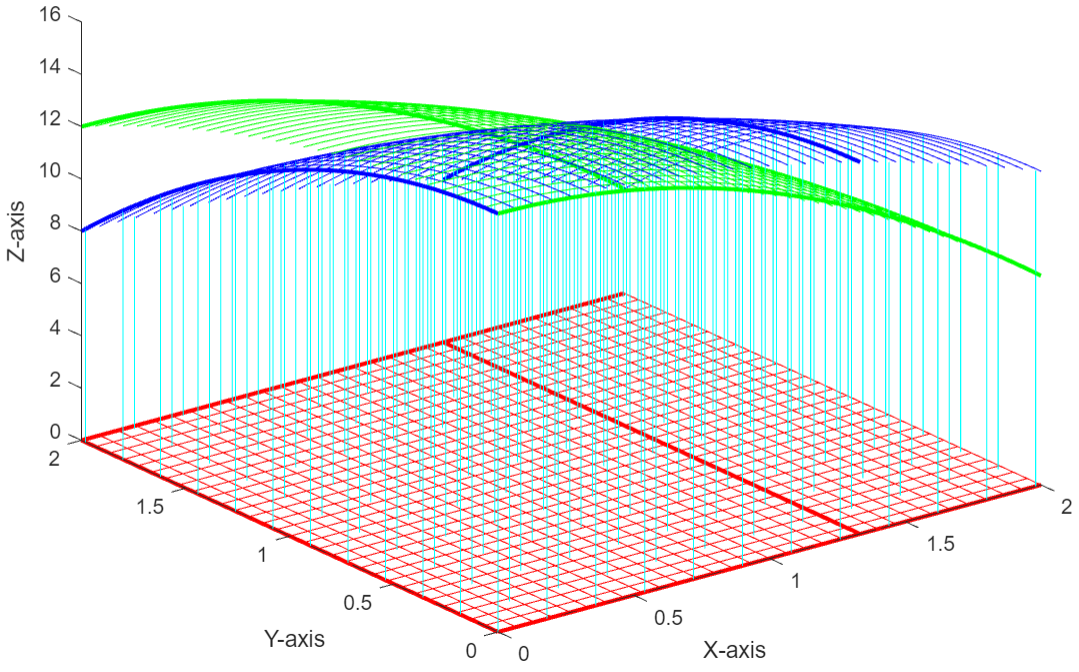
CODES:

```
close all;
clear;
clc;

syms x y z;
func(x, y) = 16 - x^2 - 2* y^2;
disp('The volume enclosed by the surface is')
int(int(func, y, 0, 2), x, 0, 2)

figure(1)
viewSolidone(z, 0 + 0 *x + 0 * y, func, y, 0 + 0*x, 2 + 0*x,
x, 0, 2);

xlabel("X-axis");
```

```
ylabel("Y-axis");
zlabel("Z-axis");
```

OUTPUT:

```
The volume enclosed by the surface is

ans =

48
```



Question 2:

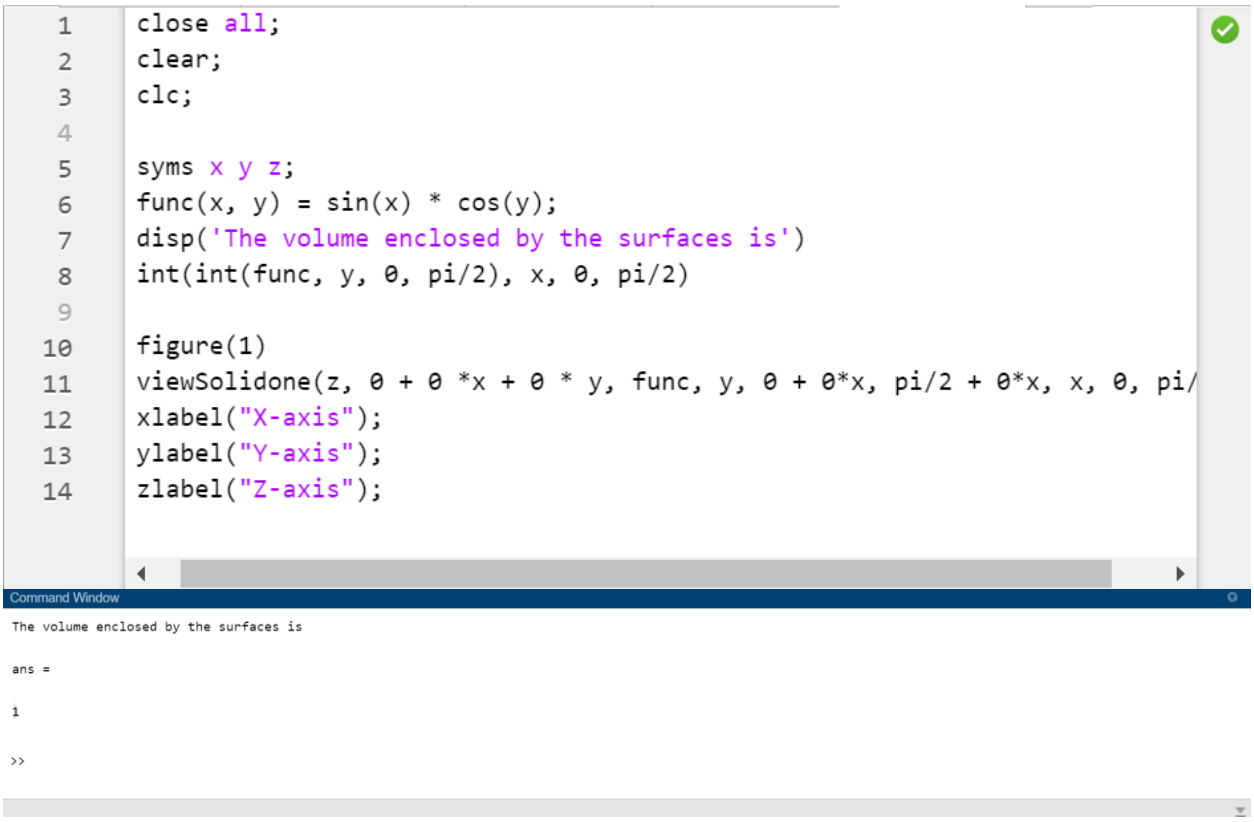
Evaluate $\iint \sin x \cos y \, dA$ where $R = [0, \pi/2] \times [0, \pi/2]$.

CODES:

```
close all;
clear;
clc;

syms x y z;
func(x, y) = sin(x) * cos(y);
disp('The volume enclosed by the surfaces is')
int(int(func, y, 0, pi/2), x, 0, pi/2)

figure(1)
viewSolidone(z, 0 + 0 *x + 0 * y, func, y, 0 +
0*x, pi/2 + 0*x, x, 0, pi/2);
xlabel("X-axis");
ylabel("Y-axis");
zlabel("Z-axis");
```

OUTPUT:

```
The volume enclosed by the surfaces is

ans =

1
```



```
close all;
clear;
clc;

syms x y z;
func(x, y) = sin(x) * cos(y);
disp('The volume enclosed by the surfaces is')
int(int(func, y, 0, pi/2), x, 0, pi/2)

figure(1)
viewSolidone(z, 0 + 0 *x + 0 * y, func, y, 0 + 0*x, pi/2 + 0*x, x, 0, pi/
xlabel("X-axis");
ylabel("Y-axis");
zlabel("Z-axis");
```

Command Window

```
The volume enclosed by the surfaces is

ans =

1

>>
```

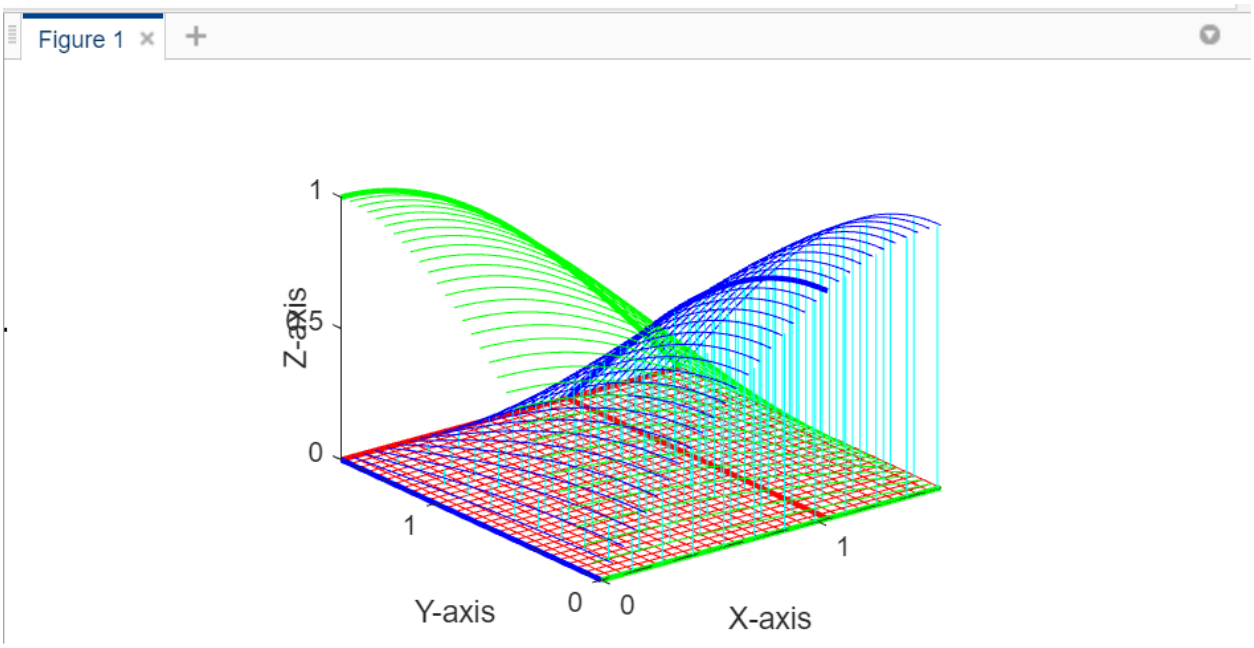


Figure 1
1
0.5
0
Z-axis
1
Y-axis
0
0
X-axis
1