

MATH7501 Practical 5, Semester 1-2021

Topic: Quiz 1 Solution and Functions of Several Variables

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Pre-Tutorial Activity

- Students must have familiarised themselves with units 1 to 3 contents (Matrices, Sets, Logic) of the reading materials for MATH7501

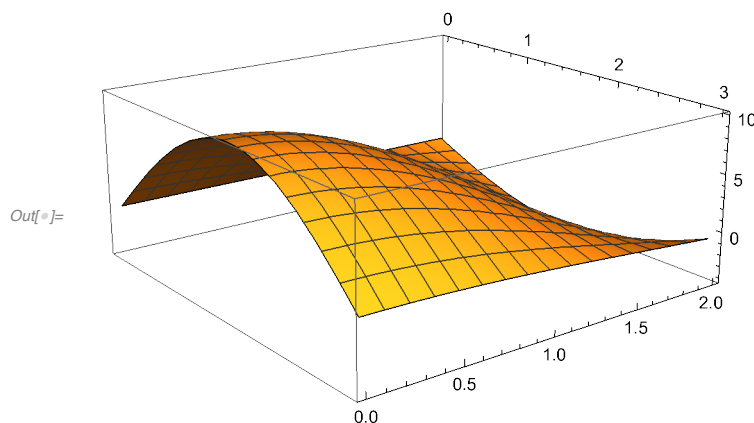
Resources

- Quiz 1 and its solution available from course website
- Chapter 4.7 (Real Functions of Several Variables) of the reading material
- <https://reference.wolfram.com/language/ref/Plot3D.html>

Real Functions of Several Variables (Chapter 4.7)

Example 1: Plot the vibration of a string, $f(x, t) = A \sin x \cos t$, where $t \in [0, 15]$ seconds, $x \in [0, 3]$ m, f is amplitude, in mm

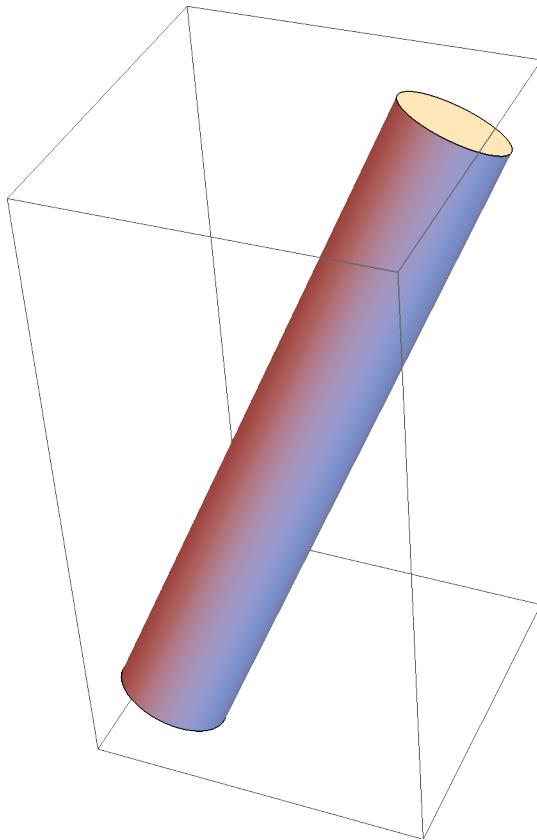
`In[]:= Plot3D[10 Sin[x] Cos[t], {x, 0, 3}, {t, 0, 2}]`



Example 2: The volume of a cylinder, $V(r, l) = \pi r^2 l$

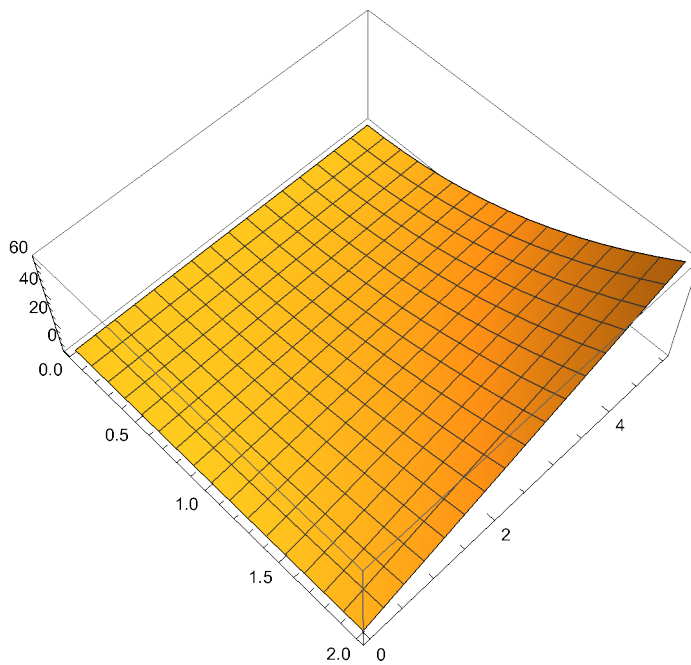
```
In[*]:= Graphics3D[Cylinder[{{0, 0, 0}, {4, 4, 10}}, 1]]
```

Out[*]=

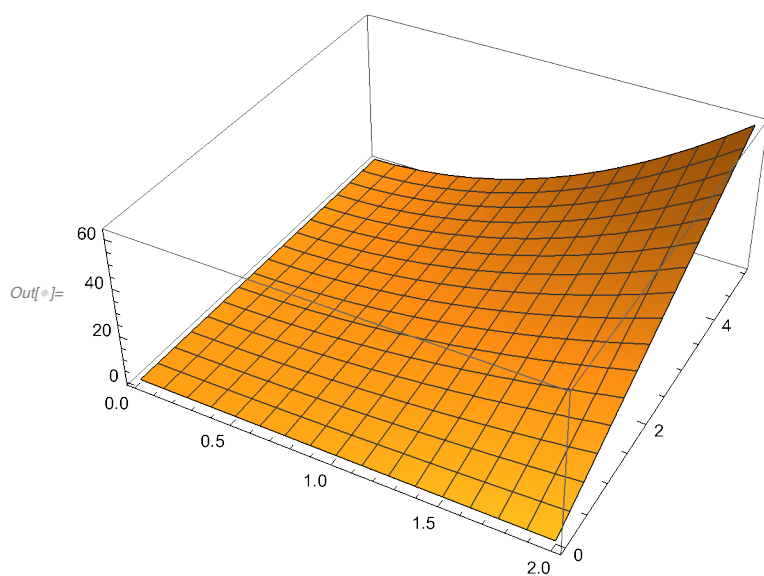


```
In[*]:= Plot3D[ $\pi r^2 l$ , {r, 0, 2}, {l, 0, 5}]
```

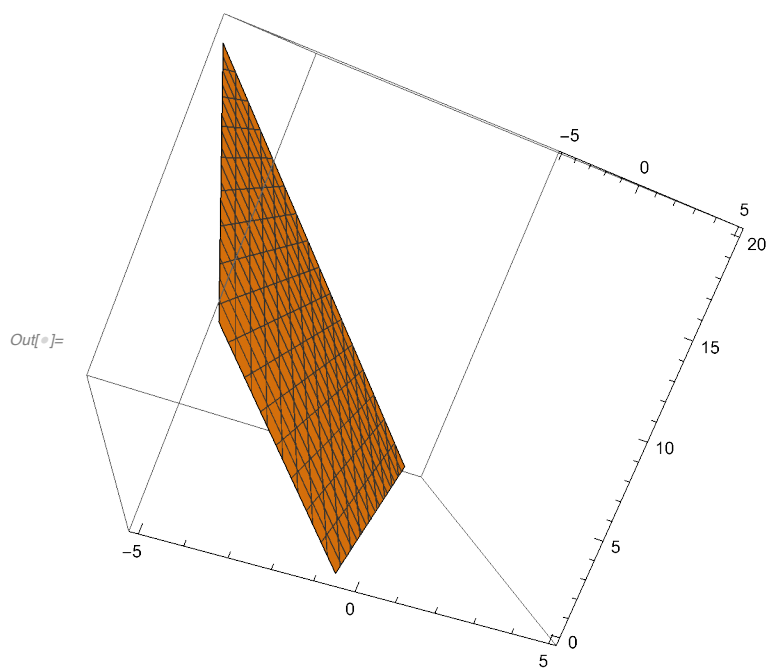
Out[*]=



```
In[*]:= Plot3D[ $\pi r^2 l$ , {r, 0, 2}, {l, 0, 5}]
```



```
In[*]:= ContourPlot3D[x + 2 y + z == 4, {x, -5, 5}, {y, -5, 5}, {z, 0, 20}]
```



```
In[ ]:= ContourPlot[ $\sqrt{x^2 + y^2}$ , {x, -5, 5}, {y, -5, 5}]
```

