

Hack the code, below to implement the problem assigned online.

$$f(x, y) = \frac{(1 + y)}{(1 + x)}$$

$$f(x, y) = \frac{1 + y}{1 + x} \quad (1)$$

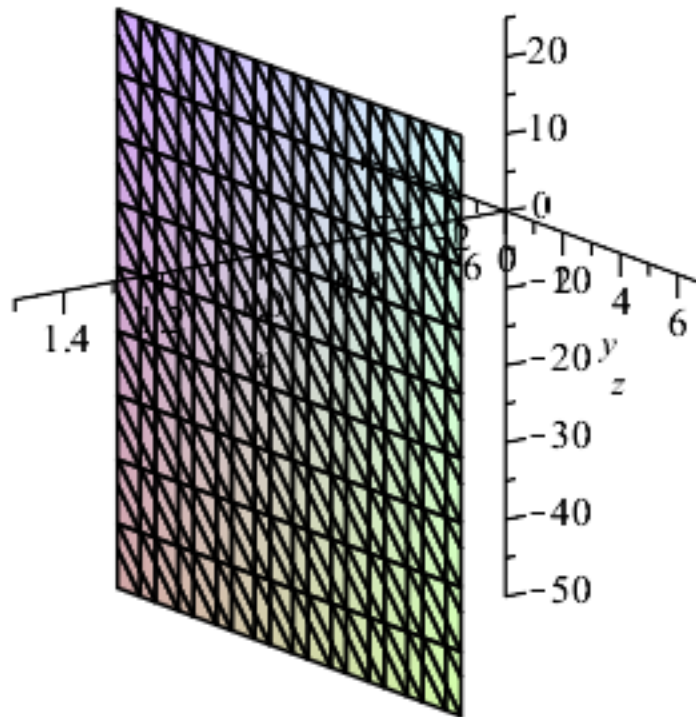
at (1, 3)

3 at (2)

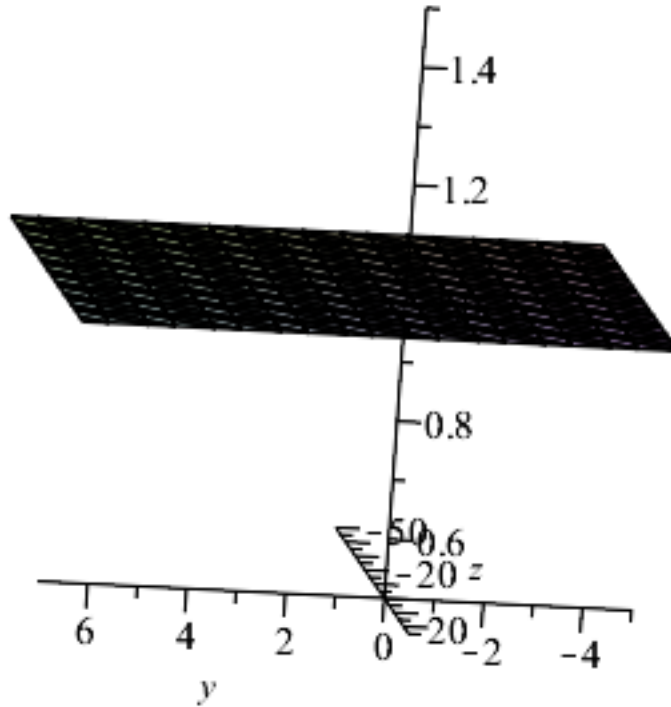
with(plots) :

with(VectorCalculus) :

```
plotplane := implicitplot3d(x = 1, x = -5 .. 5, y = -5 .. 7, z = -50 .. 25, axes = normal, style  
= surfacewireframe, transparency = .5, labels = [x - axis, y - axis, z - axis]) : %:
```



```
implicitplot3d(x = 1, x = -5 .. 5, y = -5 .. 7, z = -50 .. 25, axes = normal, style = surfacewireframe,  
transparency = .5, labels = [x - axis, y - axis, z - axis])
```



$$g := (x, y) \rightarrow \frac{(1+y)}{(1+x)}$$

$$g := (x, y) \mapsto (1+y) (1+x)^{-1} \quad (3)$$

$g(x, y)$

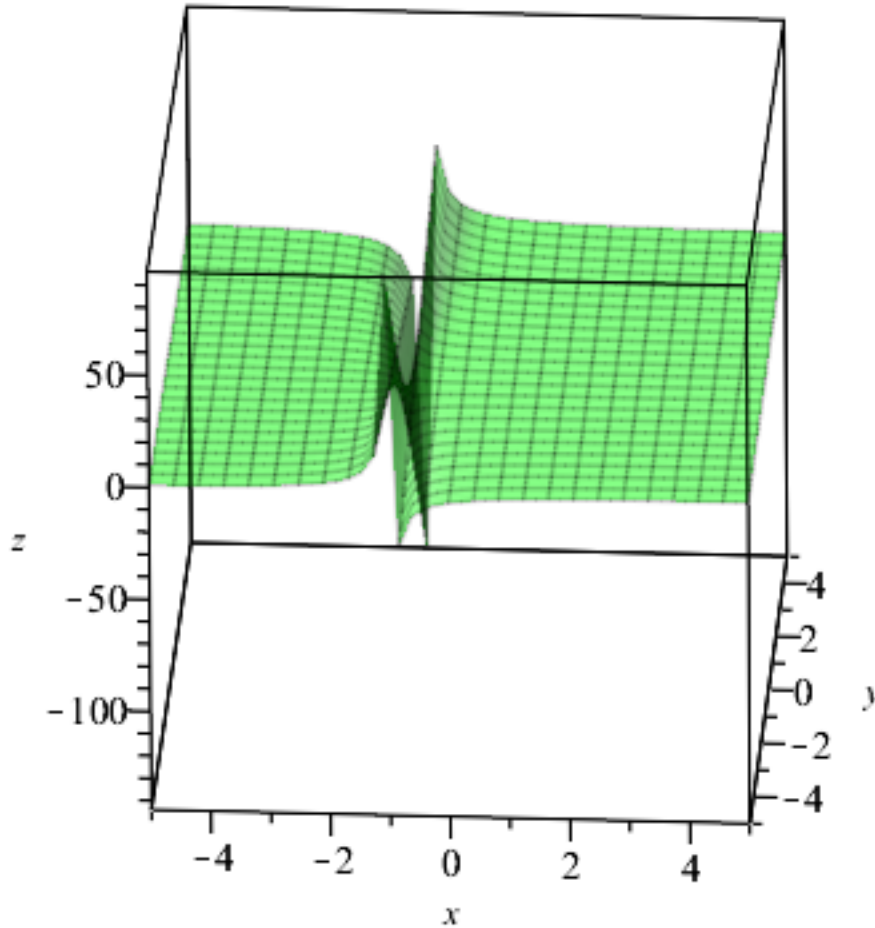
$$\frac{1+y}{1+x} \quad (4)$$

$g(1, 3)$

$$2 \quad (5)$$

`plotfunc := plot3d(g, -5 ..5, -5 ..5, axes = normal, style = surfacewireframe, color = green, transparency = .5) : %:`

`plot3d(g, -5 ..5, -5 ..5, axes = boxed, style = surfacewireframe, color = green, labels = [x, y, z], transparency = .5)`



$gx := D[1](g)$

$$gx := (x, y) \mapsto -\frac{y+1}{(x+1)^2} \quad (6)$$

$gy := D[2](g)$

$$gy := (x, y) \mapsto \frac{1}{x+1} \quad (7)$$

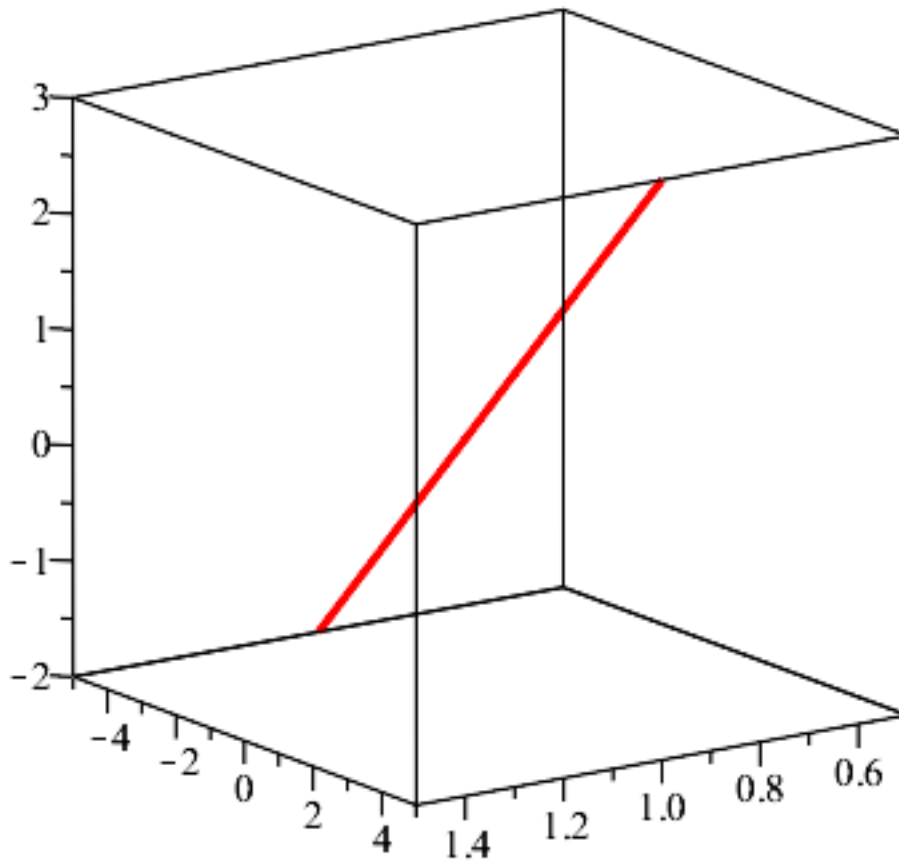
$gtrace := g(1, y)$

$$gtrace := \frac{1}{2} + \frac{y}{2} \quad (8)$$

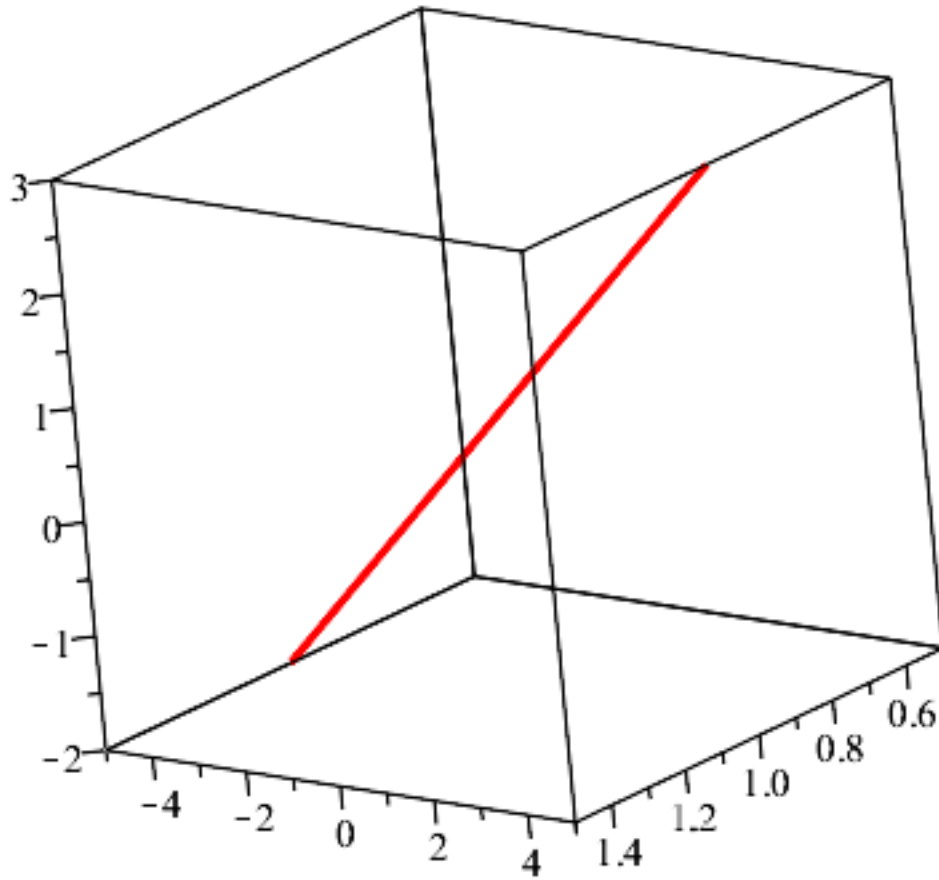
$gtraceprime := \text{diff}(gtrace, y)$

$$\frac{1}{2} \quad (9)$$

$plottanline := \text{SpaceCurve}(\langle 1, t, .5 \cdot t + .5 \rangle, t = -5 .. 5, \text{color} = \text{red}, \text{thickness} = 3) : \%$



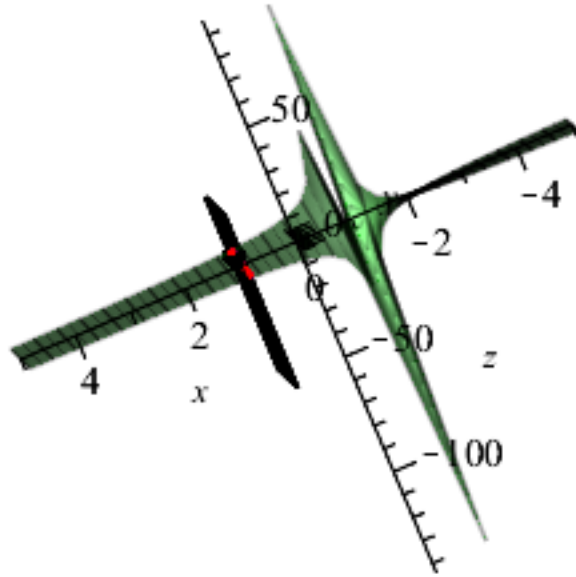
$$\text{SpaceCurve}\left(\left\langle 1, t, \frac{t}{2} + \frac{1}{2} \right\rangle, t=-5..5, \text{color}=\text{red}, \text{thickness}=3\right)$$



```

plottrace := SpaceCurve(⟨1, t, .5·t + .5⟩, t=-5..5, color=blue, thickness=3) : %:
plotthepoint := pointplot3d(⟨[1, 3, 2]⟩, symbol=solidcircle, symbolsize=20, color=black) : %:
display([plotfunc, plotplane, plottrace, plottanline, plotthepoint])

```

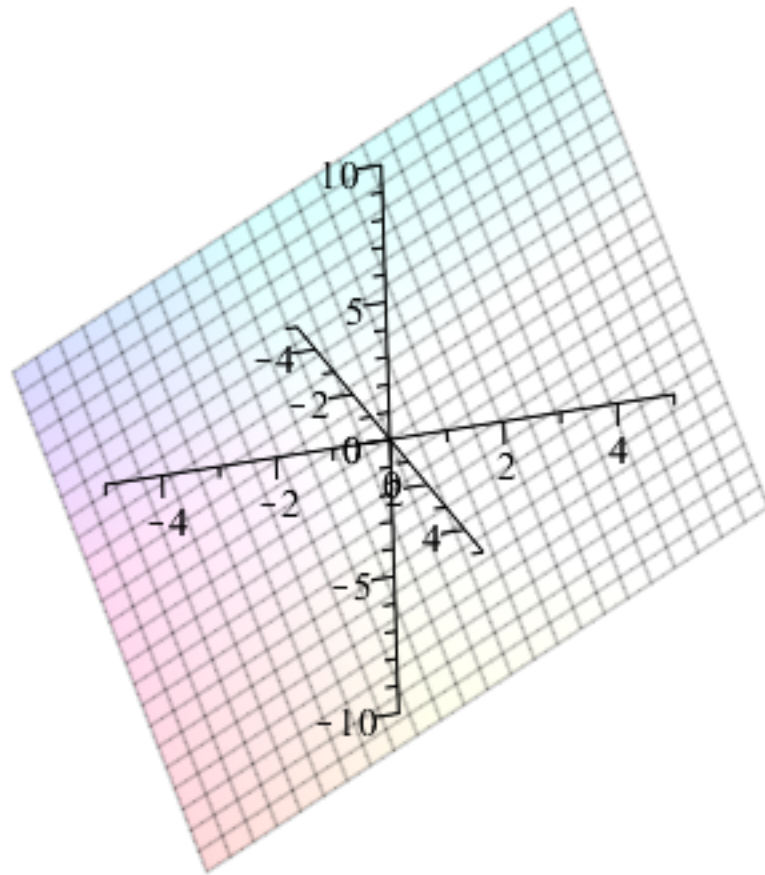


```

tanplane := (x, y) → gx(1, 3) · (x - 1) + gy(1, 3) · (y - 3) + 2
tanplane := (x, y) ↦ gx(1, 3) (x - 1) + (gy(1, 3) (y - 3)) + 2
tanplaneplot := plot3d(tanplane, -5 .. 5, -5 .. 5, axes = normal, style = surfacewireframe, color = blue) :
%:

```

(10)



display([plotfunc, tanplaneplot, plottrace, plottanline, plotthepoint], labels = [x, y, z])

