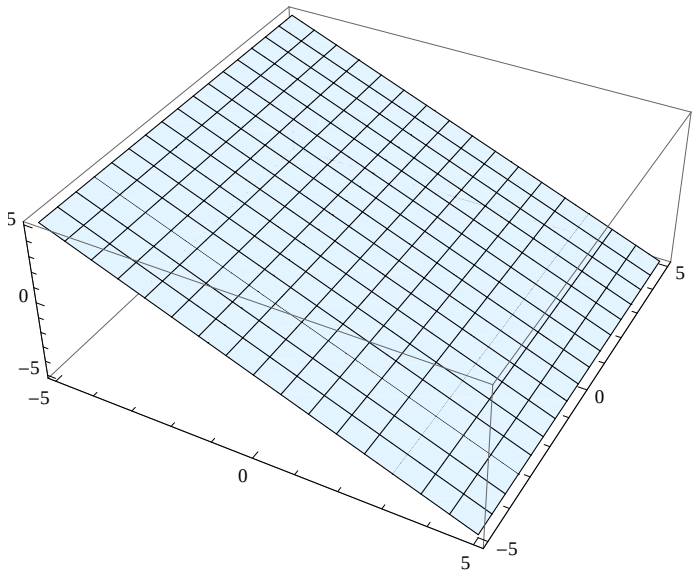
Practical-7

Plotting the characteristics for the first order PDE.

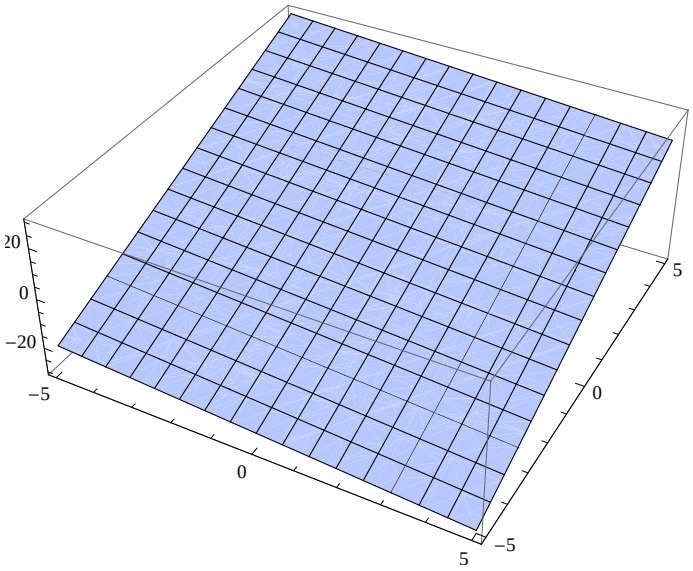
Find Characteristic Equation of the Curve (u-y)*ux+y*uy=x+y
dx/(u-y) = dy/y = du/(x+y)

On taking I+ III and II ,
we get (u+x)/y=C1
On taking I + II=III,
we get (x+y)^2-u^2=C2
On Integrate to plot this some particular values

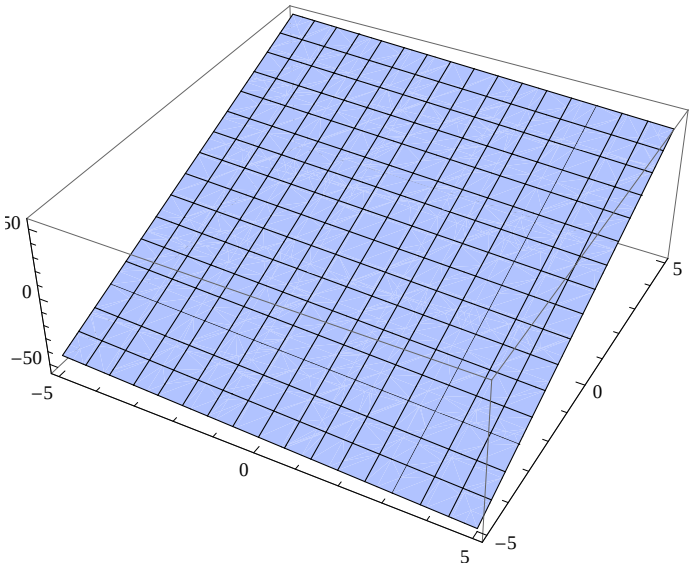
```
F0 = Plot3D[-x, {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```



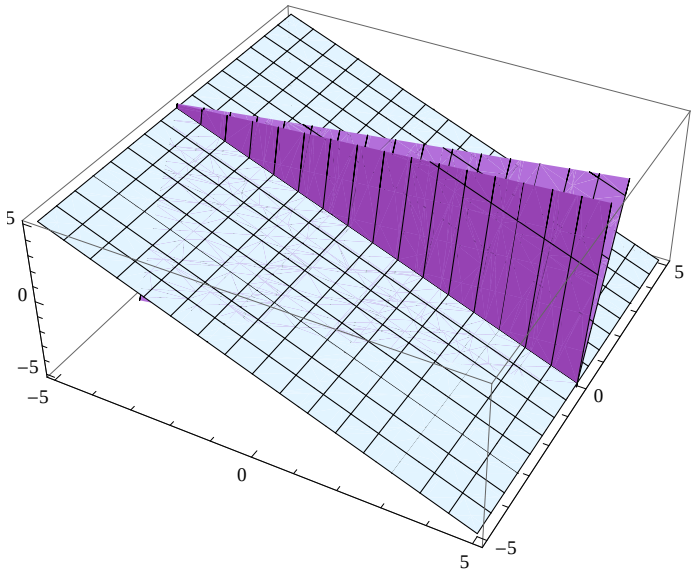
```
F1 = Plot3D[5 * y - x, {x, -5, 5},
   {y, -5, 5}, PlotPoints -> 10]
```



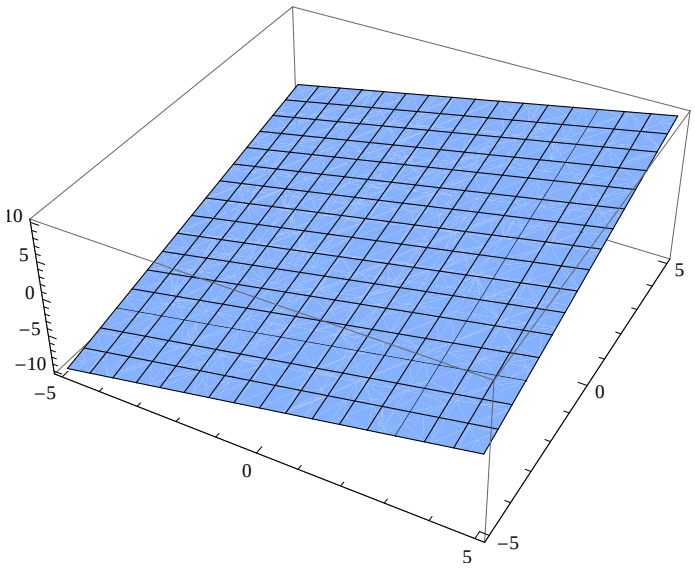

```
F2 = Plot3D[10 * y - x,
   {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```



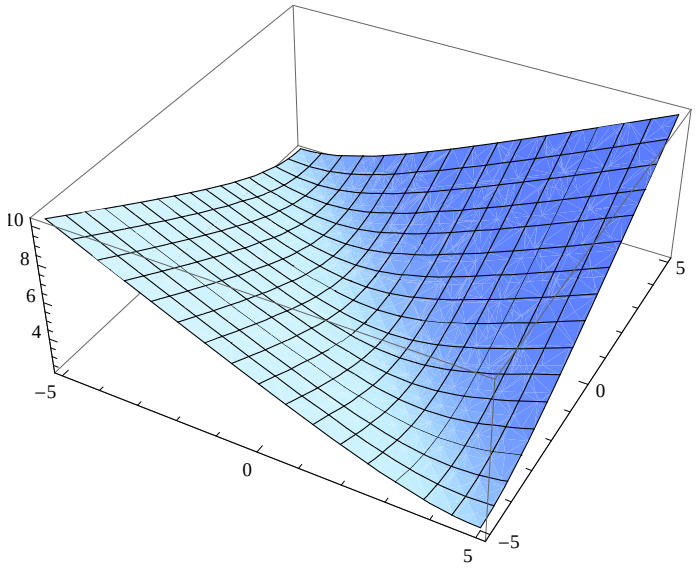
```
G1 = Show[F0, F1, F2]
```



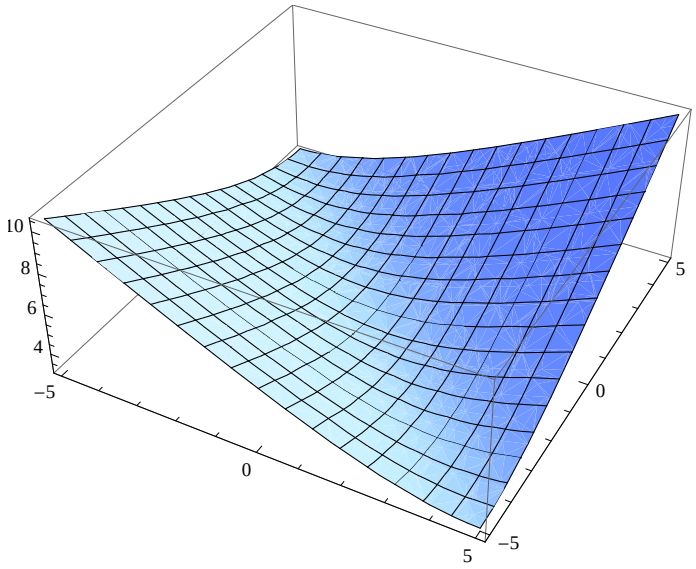

```
H0 = Plot3D[x + y, {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```



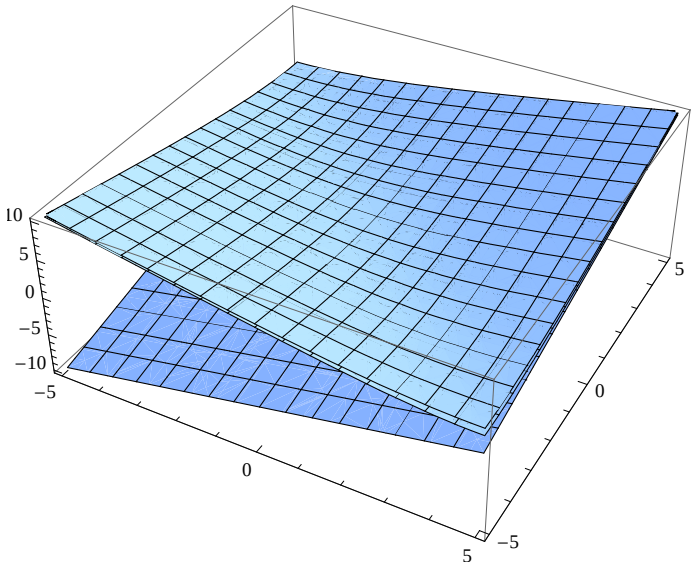
```
H1 = Plot3D[Sqrt[(x + y)^2 + 5],
   {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```




```
H2 = Plot3D[Sqrt[(x + y)^2 + 10],
   {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```



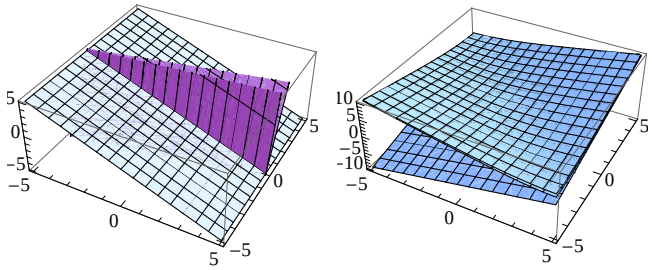
```
G2 = Show[H0, H1, H2]
```




```
Show[GraphicsArray[{G1, G2}]]
```

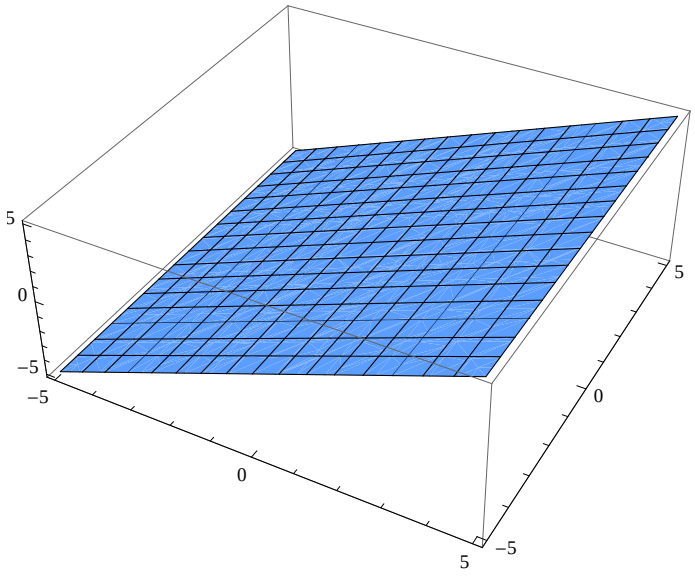
GraphicsArray::obs :

GraphicsArray is obsolete. Switching to GraphicsGrid. ≫

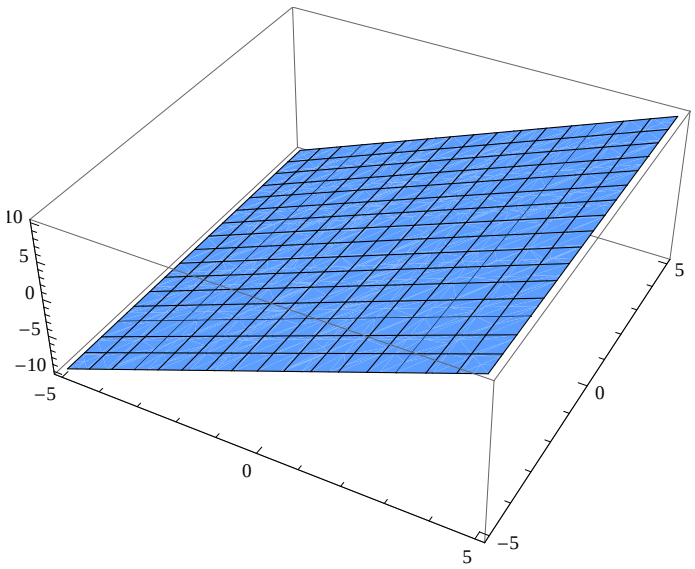


Find Characteristic Equation of the Curve (x*ux + y*uy = u)
dx/(x) = dy/(y) = du/(u)
On taking I and III ,
we get x/u = C1
On taking II = III,
we get y/u = C2
On Integrate to plot this some particular values

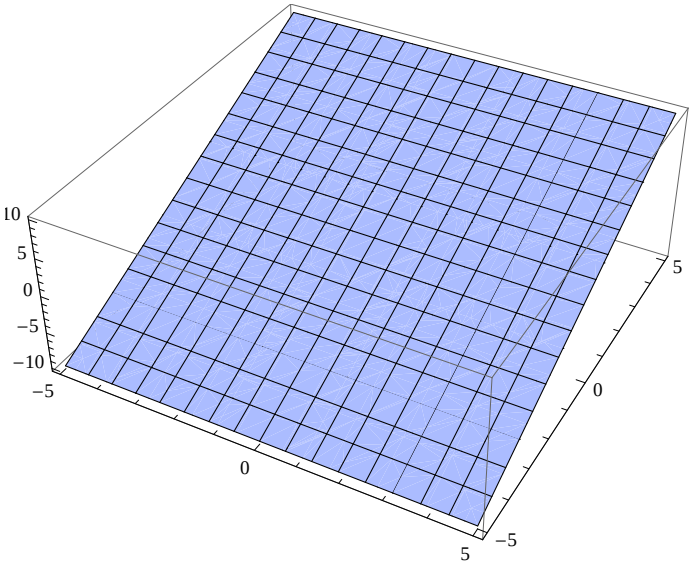
```
F0 = Plot3D[x, {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```



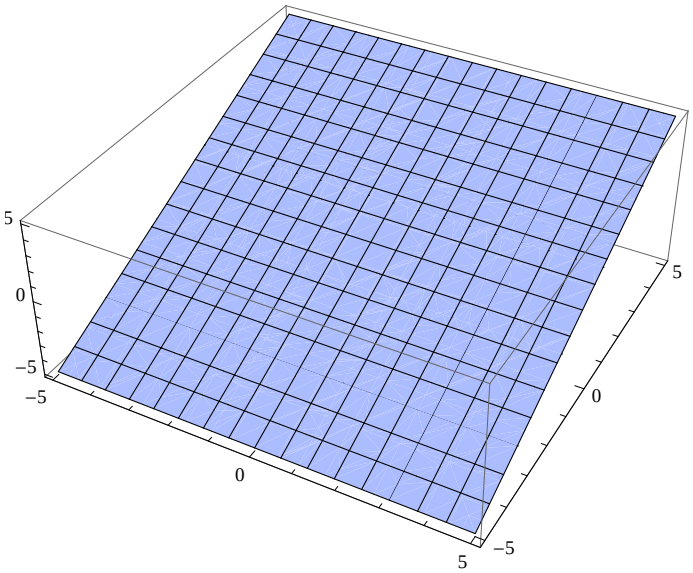

```
F1 = Plot3D[2 x, {x, -5, 5},
  {y, -5, 5}, PlotPoints -> 10]
```



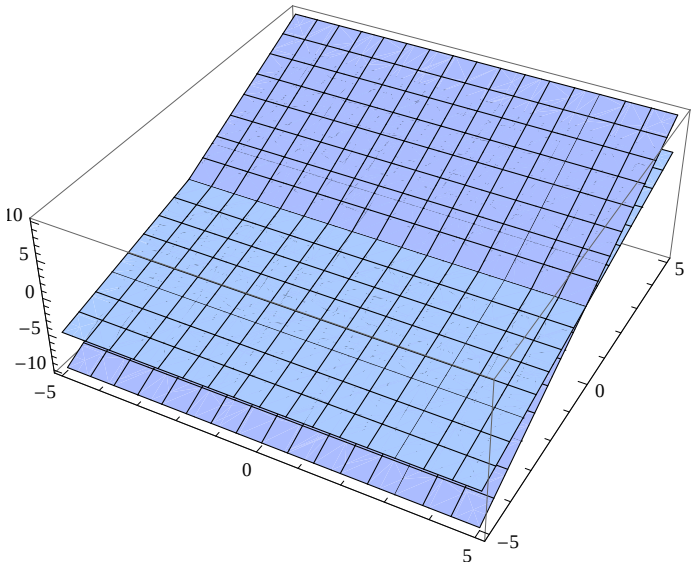
```
H0 = Plot3D[2 y, {x, -5, 5},
     {y, -5, 5}, PlotPoints → 10] H0 =
  Plot3D[2 y, {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```



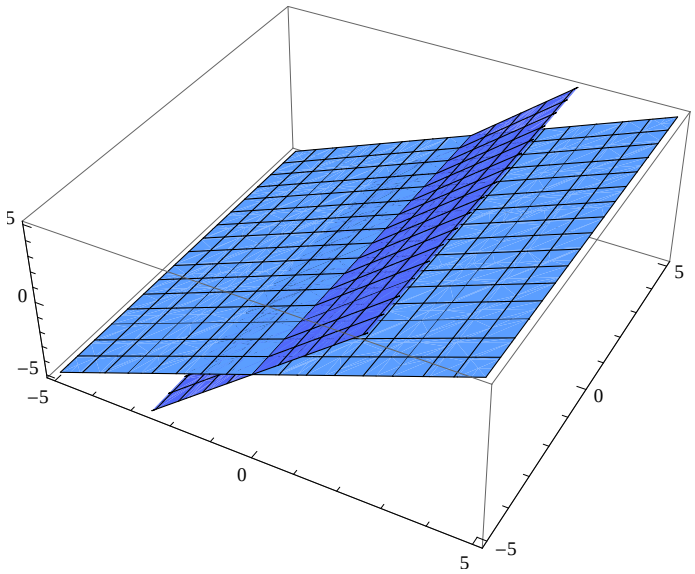

```
H1 = Plot3D[y, {x, -5, 5}, {y, -5, 5}, PlotPoints -> 10]
```



```
G2 = Show[H0, H1]
```




```
G1 = Show[F0, F1]
```




```
Show[GraphicsArray[{G1, G2}]]
```

GraphicsArray::obs :

GraphicsArray is obsolete. Switching to GraphicsGrid. ≫