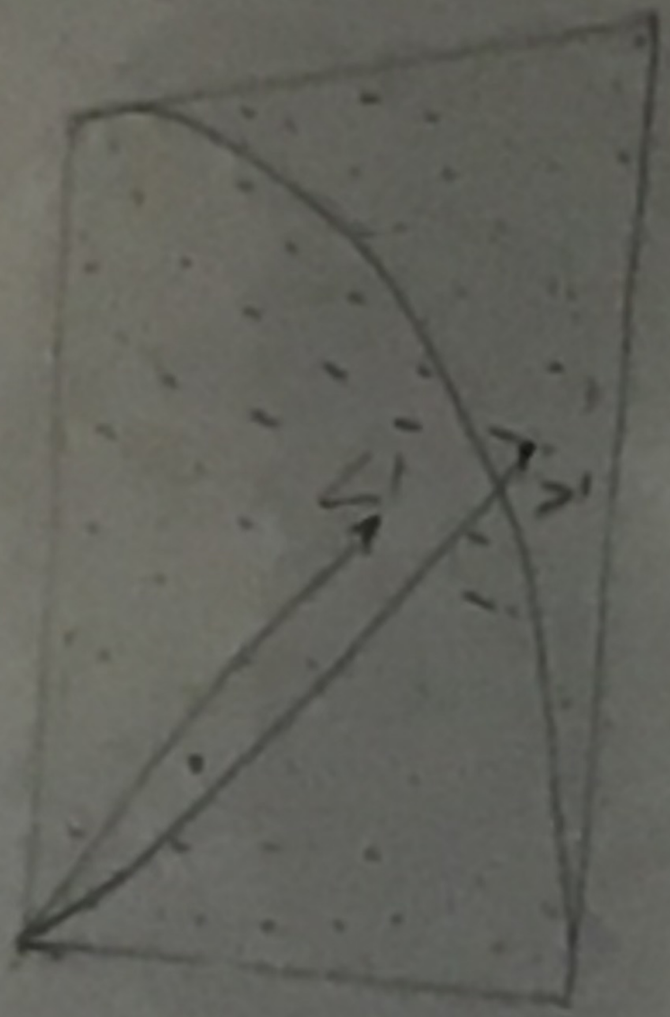
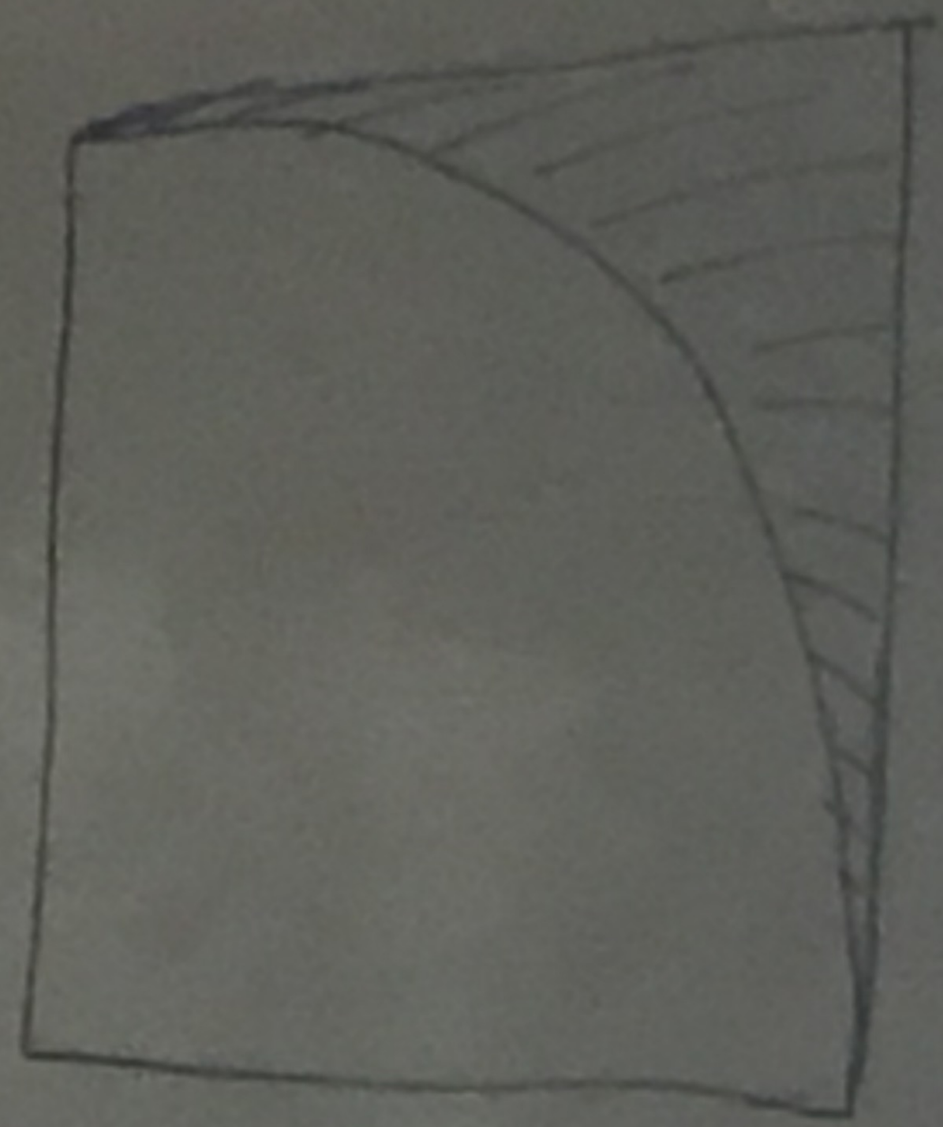


$|m$



$|m$

```python
import numpy as np
Ndim= 2
Npoints= 10000
Points = np.random.rand(Npoints,Ndim)
print("Points")
print(Points)
dfo= np.zeros((Npoints, 1))
print("dfo")
print(dfo)
Outside_points= 0
for i in range(Npoints) :
    for j in range(Ndim) :
        dfo[i] += Points[i,j]**2  #point of isq , jsq
        dfo[i] =np.sqrt(dfo[i])
    if dfo[i] > 1:
        Outside_points+= 1
print("After FOR LOOP")
print("Points")
print(Points)
print("dfo")
print(dfo)
print("Outside_points ",Outside_points)
print("Npoints ",Npoints)
print("Ratio ",Outside_points/Npoints) #ideally 1-pi/4
```

```
Points
[[0.03991251 0.6317875 ]
 [0.61063513 0.62775559]
 [0.74315733 0.12294848]
 ...
 [0.14168874 0.53854663]
 [0.24351004 0.88195589]
 [0.03590138 0.34880774]]
dfo
[[0.]
 [0.]
 [0.]
 ...
 [0.]
 [0.]
 [0.]]
After FOR LOOP
Points
[[0.03991251 0.6317875 ]
 [0.61063513 0.62775559]
 [0.74315733 0.12294848]
 ...
 [0.14168874 0.53854663]
 [0.24351004 0.88195589]
 [0.03590138 0.34880774]]
dfo
[[0.66262203]
 [1.00235334]
 [0.8707891 ]
 ...
 [0.65705495]
 [1.0106217 ]
 [0.39694863]]
Outside_points  3313
Npoints  10000
Ratio  0.3313
```