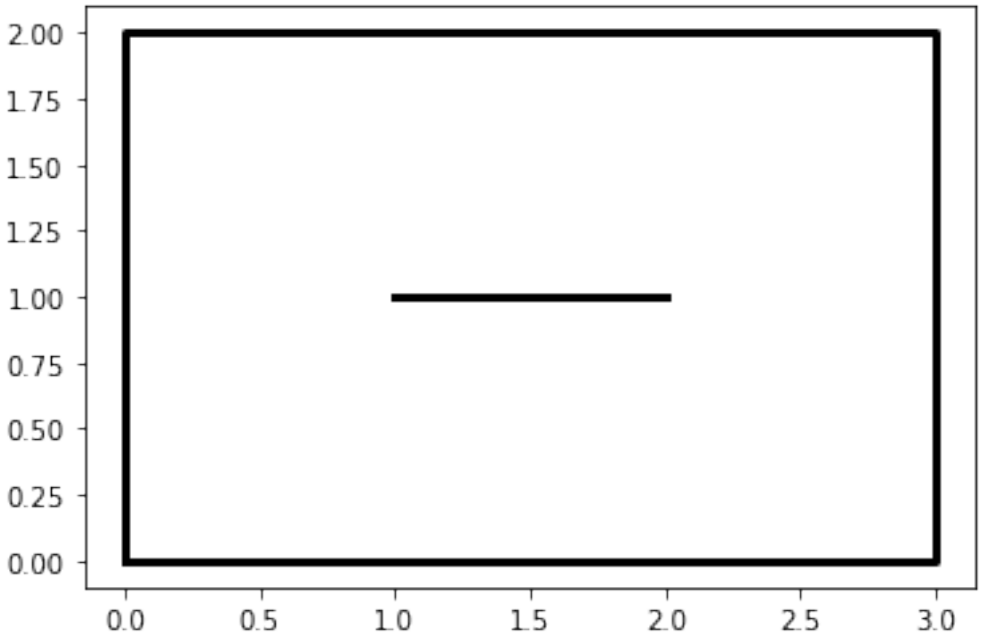
# s72

March 1, 2022

## 1 29

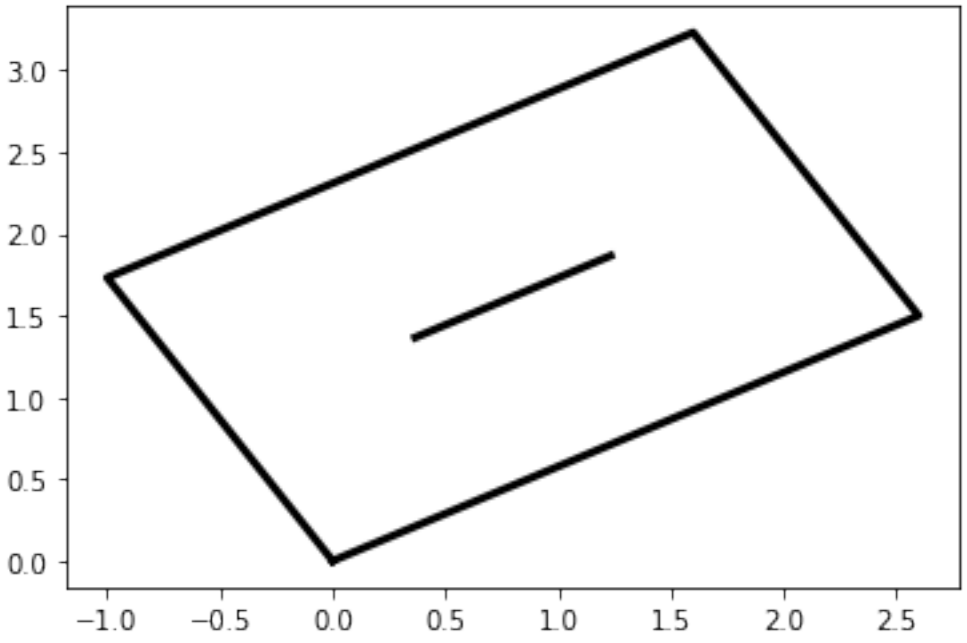
### 1.1 1

[ ]:
```
import numpy as np
import matplotlib.pyplot as plt
from math import nan, sin, cos, radians, degrees, atan


def teikna_fylki(A,c = "k"):
    # Teiknar 2 x n flatarmyndarfylki
    plt.plot(A[0], A[1], lw=3, color=c)


def hlidra(A, h):
    # Leggur h við alla dálka A
    return A + np.reshape(h, (2, 1))


M = np.array([[0, 3, 3, 0, 0, nan, 1, 2], [0, 0, 2, 2, 0, nan, 1, 1]])

teikna_fylki(M)
```



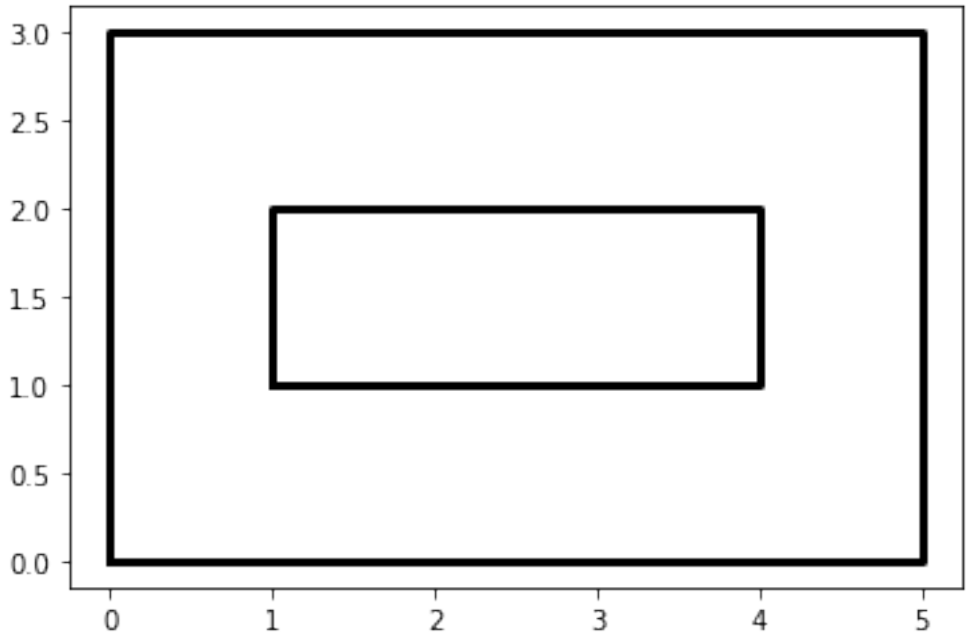

### 1.2 2

[ ]:
```
def snua(A,grad):
   rad = radians(grad)
   K = np.array([
   [cos(rad),-sin(rad)],
   [sin(rad), cos(rad)]
])
   return K @ A

C = snua(M,30)
teikna_fylki(C)
```



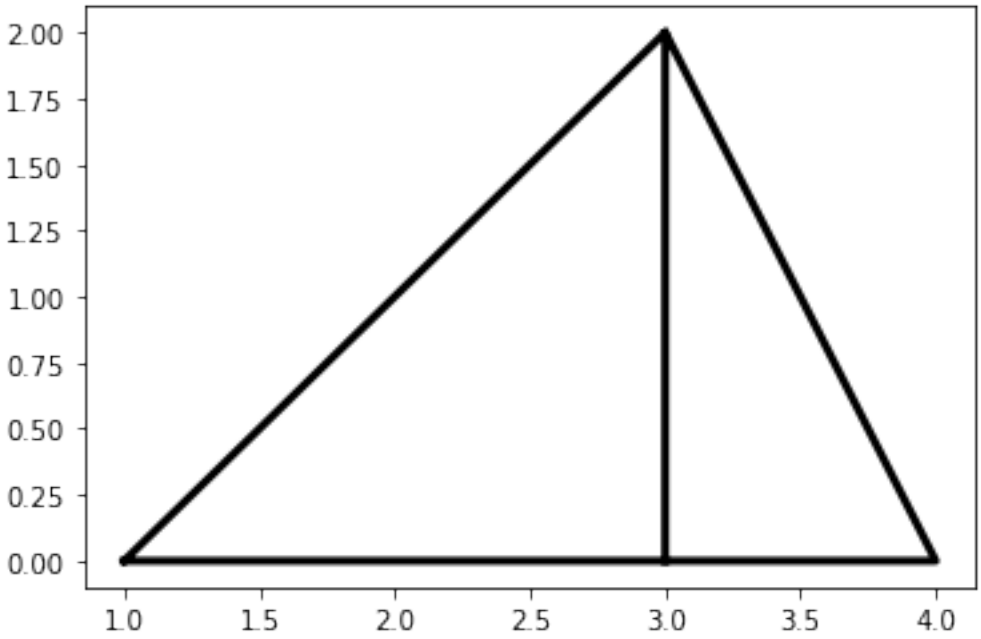

### 1.3 3

[ ]:
```
SR = np.array([
    [0,5,5,0,0,nan,1,4,4,1,1],
    [0,0,3,3,0,nan,1,1,2,2,1]
])

teikna_fylki(SR)
```



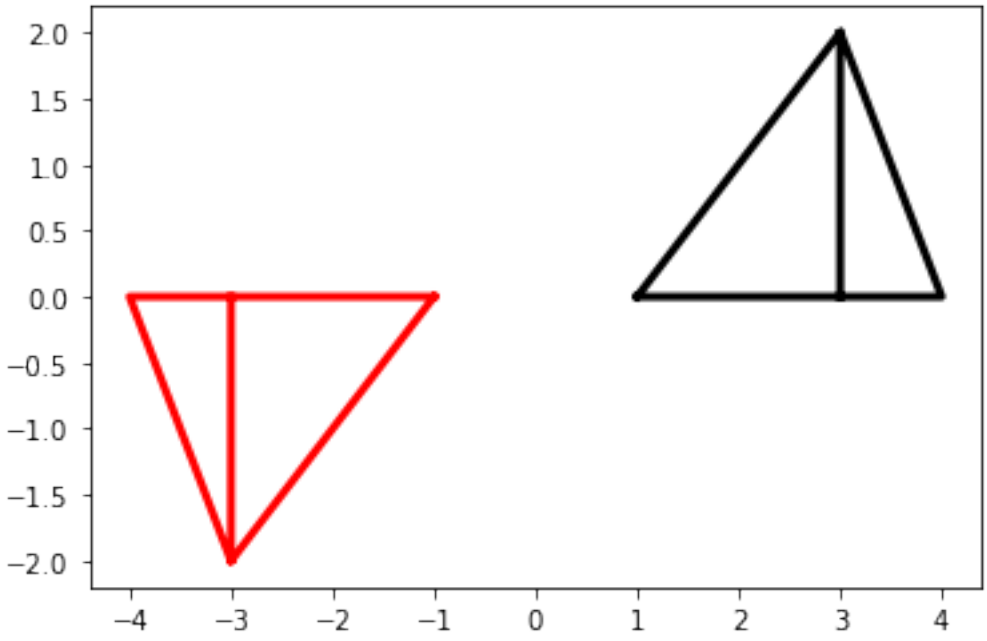

### 1.4 4

[ ]:
```
T = np.array([[1, 3, 3, nan, 3, 4, 1], [0, 2, 0, nan, 2, 0, 0]])

teikna_fylki(T)
```



### 1.5 5

[ ]:
```
teikna_fylki(T)

def hsh(fylki,grad,h):
    fylki = hlidra(fylki,h)
    fylki = snua(fylki,grad)
    fylki = hlidra(fylki,h)
    return fylki

teikna_fylki(hsh(T,180,[3,2]),"r") # geri snúna fylkið rautt til að greina í␣
 ↪sundur
```




### 1.6 6

[ ]:
```
def snuaSpeglaSnua(a, A):
  horn = degrees(atan(a))
  snuid = snua(A, -horn)

  mx = np.array([[1,0], [0,-1]])
  spegladFylki = mx @ snuid

  return snua(spegladFylki, horn)
```

```
teikna_fylki(T)
teikna_fylki(snuaSpeglaSnua(1, T,),"r")
plt.axis('scaled')
```

[ ]: (-0.19999999999999982, 4.2, -0.2, 4.2)