```
[1]  import numpy as np
     A=np.array([2,0,3])
     B=np.array([4,-3,6])
     adotb=np.dot(A,B)
     maga=np.linalg.norm(A)
     magb=np.linalg.norm(B)
     temp=(adotb/(maga*magb))
     angle=np.arccos(temp)
     ans=np.degrees(angle)
     print("The angle between A and B is:",ans)
```

```
The angle between A and B is: 22.588538787984852
```

```
[15] import math as m
     A=np.array([3,-4])
     an=m.atan(A[0]/A[1])
     Ax=A[0]*np.cos(an)
     Ay=A[1]*np.sin(an)
     Ax,Ay
```

```
(2.4000000000000004, 2.4)
```

```
[9]  A=np.array([5,6,5])
     xcos=A[0]/(np.linalg.norm(A))
     x=np.arccos(xcos)
     ansx=np.degrees(x)

     ycos=A[1]/(np.linalg.norm(A))
     y=np.arccos(ycos)
     ansy=np.degrees(y)

     zcos=A[2]/(np.linalg.norm(A))
     z=np.arccos(zcos)
     ansz=np.degrees(z)

     print("The angle with X is ",ansx)
     print("The angle with Y is ",ansy)
     print("The angle with Z is ",ansz)
```

```
The angle with X is  57.37326229346893
The angle with Y is  49.68445778922742
The angle with Z is  57.37326229346893
```

```
[12] A=np.array([2,0,3])
     B=np.array([4,-3,6])
     dot=np.dot(A,B)
     cross=np.cross(A,B)
     print("The dot product is",dot)
     print("The cross product is",cross)
```

```
The dot product is 26
The cross product is [ 9  0 -6]
```

```python
import math as m
Force=12
mass=8
g=9.8
mg=mass*g
ustatic=0.7
ukinetic=0.4
angle=30
FX=Force*(m.cos(angle))
FY=Force*(m.sin(angle))
R=mg+FY
Statfric=R*ustatic
Kinfric=R*ukinetic
if(FX>Statfric):
  print("Block is sliding")
else:
  print("Block is stationary")
```

```
Block is stationary
```

```
import math as m

A=44
B=22
g=9.81
ustatic=0.2
ukinetic=0.15



W=((B-(A*ustatic))/ustatic)

print("The weight is",W )
```

```
The weight is 65.99999999999999
```

```
[25] Kinfric=A*ukinetic

ma=A/g
mb=B/g

acc=((B-Kinfric)/(ma+mb))

print("The weight is",acc)
```

```
The weight is 2.289
```