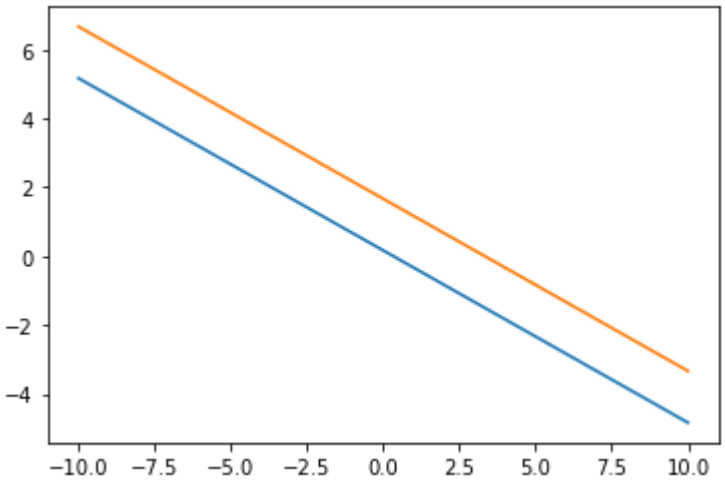
In [15]:
```
import numpy as np
import matplotlib.pyplot as plt
from scipy import linalg as la
from numpy.linalg import matrix_rank
```

Question 1

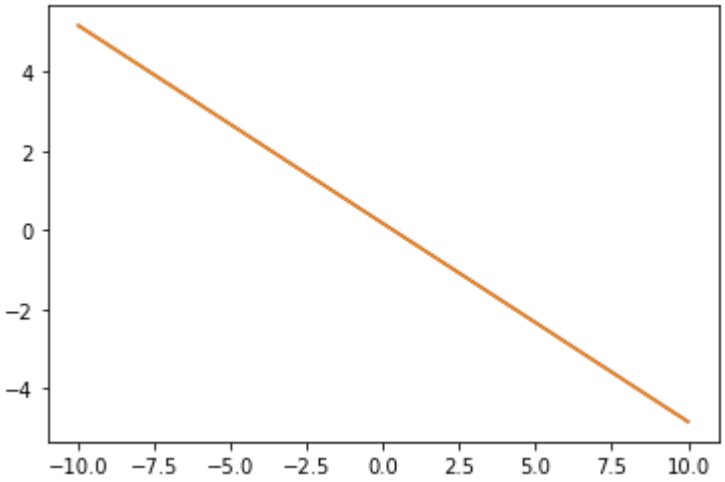
In [16]:
```
x = np.linspace(-10,10)

plt.plot(x, (1 - 3*x)/6)
plt.plot(x,(20 - 6*x)/12)
plt.show()
```



In [17]:
```
x = np.linspace(-10,10)

plt.plot(x, (1 - 3*x)/6)
plt.plot(x,(2 - 6*x)/12)
plt.show()
```



Question 2

In [22]:
```
a = np.array([[2, 3, 1], [-2, 3, -2], [1, -1, 4]])
b = np.array([12, 1, 16])
```

```
x = np.linalg.solve(a, b)

print('The solution of the system of equation is',x)
```

```
The solution of the system of equation is [-1.  3.  5.]
```

Question 3

In [21]:

```
mat = np.array([[1,3,1,2,0],[0,0,2,1,3],[0,0,0,3,2],[0,0,0,3,-1]])
print('The rank of the matrix is:',matrix_rank(mat))

mat = np.array([[-1, 1, 0, -1],[-2, 2, 1, -4],[-1, 1, -2, 3]])
print('The rank of the matrix is:',matrix_rank(mat))
```

```
The rank of the matrix is: 4
The rank of the matrix is: 2
```