In [44]:

```
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
sns.set(style="darkgrid")
```

In [9]:

```
##############A.11##############
A = np.array([[0,2,4],[2,4,2],[3,3,1]])
b = np.array([[-2],[-2],[-4]])
c = np.array([[-1],[-1],[-1]])
```

In [55]:

```
#########A.11(a)###########3
inv_A = np.linalg.inv(A)
print(inv_A)
```

```
[[ 0.125 -0.625  0.75 ]
 [-0.25   0.75  -0.5  ]
 [ 0.375 -0.375  0.25 ]]
```

In [15]:

```
#############A.11(b)################
print(np.matmul(inv_A,b))
```

```
[[-2.]
 [ 1.]
 [-1.]]
```

In [16]:

```
#############A.11(b##########
print (np.matmul(A,c))
```

```
[[-6]
 [-8]
 [-7]]
```

In [18]:

```
##########################A.12################################
```


In [54]:

```
n=int(1/4*1/(.0025)**2)
Z=np.random.randn(n)
plt.figure(figsize=(20,10))
plt.step(sorted(Z), np.arange(1,n+1)/float(n),  label = 'Gaussian')
plt.xlim(-3, 3)
n=40000
ks = [1,8,64,512]
yks = []
for k in ks:
    yk = np.sum(np.sign(np.random.randn(n,k)) * np.sqrt(1./k), axis=1)
    yks.append(yk)
    plt.step(sorted(yk), np.arange(1,n+1)/float(n), label = 'k={}'.format(k))

plt.legend(ncol=1, loc='upper left')
plt.ylabel('Cumulative probability', fontsize=12)
plt.xlabel('Values', fontsize=12)
```

Out[54]:

```
Text(0.5, 0, 'Observations')
```