

```
>> A=[4 -5;2 -3]
```

```
A =
```

```
 4 -5  
 2 -3
```

```
>> syms lambda
```

```
>> B=A-lambda*eye(2)
```

```
B =
```

```
[ 4 - lambda,    -5]  
 [      2, - lambda - 3]
```

```
>> det(B)
```

```
ans =
```

```
lambda^2 - lambda - 2
```

```
>> solve('lambda^2 - lambda - 2=0','lambda')
```

```
ans =
```

```
 2  
-1
```

```
>> C=A-2*eye(2)
```

```
C =
```

```
 2 -5  
 2 -5
```

```
>> rref(C)
```

```
ans =
```

```
 1.0000 -2.5000  
 0      0
```

```
>> %x_1=2.5x_2, x_2=x_2 --> v_1=[5;2]
```

```
>> v_1=[5;2]
```

```
v_1 =
```

```
5  
2
```

```
>> D=A+eye(2)
```

```
D =
```

```
5 -5  
2 -2
```

```
>> rref(D)
```

```
ans =
```

```
1 -1  
0 0
```

```
>> %x_1=x_2, x_2=x_2 --> v_2=[1;1]
```

```
>> v_2=[1;1]
```

```
v_2 =
```

```
1  
1
```

```
>> A*v_1
```

```
ans =
```

```
10  
4
```

```
>> 2*v_1
```

```
ans =
```

```
10  
4
```

```
>> A*v_2
```

```
ans =
```

```
-1  
-1
```

```
>> -1*v_2
```

ans =

-1
-1

>>

>> [xi,R]=eig(sym(A))

xi =

[1, 5/2]
[1, 1]

R =

[-1, 0]
[0, 2]

>> P=[1 5;1 2]

P =

1 5
1 2

>> inv(P)*A*P

ans =

-1.0000 0
0.0000 2.0000

>>

>> A=[1 -10;1 3]

A =

1 -10
1 3

>> [xi,R]=eig(sym(A))

xi =

[- 1 - 3*i, - 1 + 3*i]
[1, 1]

R =

```
[ 2 - 3*i,  0]
[   0, 2 + 3*i]
```

>>

```
>> P=[-1 -3;1 0]
```

P =

```
-1 -3
 1  0
```

```
>> inv(P)*A*P
```

ans =

```
 2.0000 -3.0000
 3.0000  2.0000
```

>>

```
>> atan(3/2)
```

ans =

```
0.9828
```

```
>> r=sqrt(3^2+2^2)
```

r =

```
3.6056
```

>>