In [48]:
```
from qutip import *
```

In [49]:
```
import numpy as np

import matplotlib.pyplot as plt
```

In [50]:
```
print(Qobj([[0],[0],[0],[0]]))
```

```
Quantum object: dims = [[4], [1]], shape = (4, 1), type = ket
Qobj data =
[[0.]
 [0.]
 [0.]
 [0.]]
```

In [51]:
```
x = np.array([[0, 0, 0, 0]])
```

In [52]:
```
print(Qobj(x))
```

```
Quantum object: dims = [[1], [4]], shape = (1, 4), type = bra
Qobj data =
[[0. 0. 0. 0.]]
```

In [53]:
```
basis(4,0)
```

Out[53]: Quantum object: dims = [[4], [1]], shape = (4, 1), type = ket

$$\begin{pmatrix} 1.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix}$$

In [54]:
```
basis(4,1)
```

Out[54]: Quantum object: dims = [[4], [1]], shape = (4, 1), type = ket

$$\begin{pmatrix} 0.0 \\ 1.0 \\ 0.0 \\ 0.0 \end{pmatrix}$$

In [55]:
```
coherent(4,0.5-0.5j)
```

Out[55]: Quantum object: dims = [[4], [1]], shape = (4, 1), type = ket

$$\begin{pmatrix} 0.779 \\ (0.390 - 0.390j) \\ -0.273j \\ (-0.088 - 0.088j) \end{pmatrix}$$

In [56]:
```
destroy(4)
```

Out[56]: Quantum object: dims = [[4], [4]], shape = (4, 4), type = oper, isherm = False

$$\begin{pmatrix} 0.0 & 1.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 1.414 & 0.0 \\ 0.0 & 0.0 & 0.0 & 1.732 \\ 0.0 & 0.0 & 0.0 & 0.0 \end{pmatrix}$$

In [57]:
```
sigmax()
```

Out[57]: Quantum object: dims = [[2], [2]], shape = (2, 2), type = oper, isherm = True

$$\begin{pmatrix} 0.0 & 1.0 \\ 1.0 & 0.0 \end{pmatrix}$$

In [58]:
```
sigmay()
```

Out[58]: Quantum object: dims = [[2], [2]], shape = (2, 2), type = oper, isherm = True

$$\begin{pmatrix} 0.0 & -1.0j \\ 1.0j & 0.0 \end{pmatrix}$$

In [59]:
```
sigmaz()
```

Out[59]: Quantum object: dims = [[2], [2]], shape = (2, 2), type = oper, isherm = True

$$\begin{pmatrix} 1.0 & 0.0 \\ 0.0 & -1.0 \end{pmatrix}$$

In [60]:
```
jmat(5/2.0, '-')
```

Out[60]: Quantum object: dims = [[6], [6]], shape = (6, 6), type = oper, isherm = False

$$\begin{pmatrix} 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 2.236 & 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 2.828 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 3.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 2.828 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 2.236 & 0.0 \end{pmatrix}$$

In [61]:
```
jmat(5/2.0, '+')
```

Out[61]: Quantum object: dims = [[6], [6]], shape = (6, 6), type = oper, isherm = False

$$\begin{pmatrix} 0.0 & 2.236 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 2.828 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 3.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 2.828 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 2.236 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \end{pmatrix}$$

In [62]:
```
obj = Qobj([[0],[1]])
```

In [63]:
```
print(obj)
```

```
Quantum object: dims = [[2], [1]], shape = (2, 1), type = ket
Qobj data =
[[0.]
 [1.]]
```

In [64]:
```
obj.isherm
```

Out[64]: False

In [65]:
```
obj = sigmax()
```

In [66]:
```
obj.isherm
```

Out[66]: True

In [67]:
```
obj = coherent(2,1)
```

In [68]:
```
print(obj)
```

```
Quantum object: dims = [[2], [1]], shape = (2, 1), type = ket
Qobj data =
[[0.54030231]
 [0.84147098]]
```

In [69]:
```
obj.isherm
```

Out[69]:
```
False
```

In [70]:
```
obj = sigmaz()
```

In [71]:
```
obj.isherm
```

Out[71]:
```
True
```

In [ ]:

In [ ]: