We combine states by help of the Kronecker-product.

| Spin states along the $z$-axis: | Spin states along the $x$-axis: | Spin along the $y$-axis: |
|---|---|---|
| $\|0\rangle = \begin{pmatrix}1\\0\end{pmatrix}$ | $\|+\rangle = \frac{1}{\sqrt{2}}(\|0\rangle + \|1\rangle) = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\1\end{pmatrix}$ | $\|(y+)\rangle = \frac{1}{\sqrt{2}}(\|0\rangle + i\|1\rangle) = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\i\end{pmatrix}$ |
| $\|1\rangle = \begin{pmatrix}0\\1\end{pmatrix}$ | $\|-\rangle = \frac{1}{\sqrt{2}}(\|0\rangle - \|1\rangle) = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\-1\end{pmatrix}$ | $\|(y-)\rangle = \frac{1}{\sqrt{2}}(\|0\rangle - i\|1\rangle) = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\-i\end{pmatrix}$ |

Tensor-product or Kronecker-product for two qubits (separable states):

$$\begin{pmatrix}a\\b\end{pmatrix} \otimes \begin{pmatrix}c\\d\end{pmatrix} = \begin{pmatrix}ac\\ad\\bc\\bd\end{pmatrix}$$

Note: $|+\rangle$ and $|-\rangle$ are the qubits on the Bloch-sphere in $x$ and $-x$ direction.

Note: $(y+)$ and $(y-)$ are the qubits on the Bloch-sphere in $y$ and $-y$ direction. We write these with brackets to avoid confusion.

We have six orthogonal states, combining them gives 36 combinations.

| | | | | | |
|---|---|---|---|---|---|
| $\|00\rangle = \begin{pmatrix}1\\0\\0\\0\end{pmatrix}$ | $\|10\rangle = \begin{pmatrix}0\\0\\1\\0\end{pmatrix}$ | $\|+0\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\1\\0\end{pmatrix}$ | $\|-0\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\-1\\0\end{pmatrix}$ | $\|(y+)0\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\i\\0\end{pmatrix}$ | $\|(y-)0\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\-i\\0\end{pmatrix}$ |
| $\|01\rangle = \begin{pmatrix}0\\1\\0\\0\end{pmatrix}$ | $\|11\rangle = \begin{pmatrix}0\\0\\0\\1\end{pmatrix}$ | $\|+1\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\1\end{pmatrix}$ | $\|-1\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\-1\end{pmatrix}$ | $\|(y+)1\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\i\end{pmatrix}$ | $\|(y-)1\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\-i\end{pmatrix}$ |
| $\|0+\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\1\\0\\0\end{pmatrix}$ | $\|1+\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\1\end{pmatrix}$ | $\|++\rangle = \frac{1}{2}\begin{pmatrix}1\\1\\1\\1\end{pmatrix}$ | $\|-+\rangle = \frac{1}{2}\begin{pmatrix}1\\1\\-1\\-1\end{pmatrix}$ | $\|(y+)+\rangle = \frac{1}{2}\begin{pmatrix}1\\1\\i\\i\end{pmatrix}$ | $\|(y-)+\rangle = \frac{1}{2}\begin{pmatrix}1\\1\\-i\\-i\end{pmatrix}$ |
| $\|0-\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\-1\\0\\0\end{pmatrix}$ | $\|1-\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\-1\end{pmatrix}$ | $\|+-\rangle = \frac{1}{2}\begin{pmatrix}1\\-1\\1\\-1\end{pmatrix}$ | $\|--\rangle = \frac{1}{2}\begin{pmatrix}1\\-1\\-1\\1\end{pmatrix}$ | $\|(y+)-\rangle = \frac{1}{2}\begin{pmatrix}1\\-1\\i\\-i\end{pmatrix}$ | $\|(y-)-\rangle = \frac{1}{2}\begin{pmatrix}1\\-1\\-i\\i\end{pmatrix}$ |
| $\|0(y+)\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\i\\0\\0\end{pmatrix}$ | $\|1(y+)\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\i\end{pmatrix}$ | $\|+(y+)\rangle = \frac{1}{2}\begin{pmatrix}1\\i\\1\\i\end{pmatrix}$ | $\|-(y+)\rangle = \frac{1}{2}\begin{pmatrix}1\\i\\-1\\-i\end{pmatrix}$ | $\|(y+)(y+)\rangle = \frac{1}{2}\begin{pmatrix}1\\i\\i\\-1\end{pmatrix}$ | $\|(y-)(y+)\rangle = \frac{1}{2}\begin{pmatrix}1\\i\\-i\\1\end{pmatrix}$ |
| $\|0(y-)\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\-i\\0\\0\end{pmatrix}$ | $\|1(y-)\rangle = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\-i\end{pmatrix}$ | $\|+(y+)\rangle = \frac{1}{2}\begin{pmatrix}1\\-i\\1\\-i\end{pmatrix}$ | $\|-(y-)\rangle = \frac{1}{2}\begin{pmatrix}1\\-i\\-1\\i\end{pmatrix}$ | $\|(y+)(y-)\rangle = \frac{1}{2}\begin{pmatrix}1\\-i\\i\\1\end{pmatrix}$ | $\|(y-)(y-)\rangle = \frac{1}{2}\begin{pmatrix}1\\-i\\-i\\-1\end{pmatrix}$ |

Remark: If we treat $0, 1, -1, i, -i$ as five individual symbols and combine them into one vector of dimension four, we get $5^4 = 625$ combinations including the zero-vector. Even if we take out the duplicates we see that the possible state-space is much larger than the combinations via the Kronecker-product.

The basis sets for 3 components:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $\|000\rangle = \begin{pmatrix}1\\0\\0\\0\\0\\0\\0\\0\end{pmatrix}$ | $\|001\rangle = \begin{pmatrix}0\\1\\0\\0\\0\\0\\0\\0\end{pmatrix}$ | $\|010\rangle = \begin{pmatrix}0\\0\\1\\0\\0\\0\\0\\0\end{pmatrix}$ | $\|011\rangle = \begin{pmatrix}0\\0\\0\\1\\0\\0\\0\\0\end{pmatrix}$ | $\|100\rangle = \begin{pmatrix}0\\0\\0\\0\\1\\0\\0\\0\end{pmatrix}$ | $\|101\rangle = \begin{pmatrix}0\\0\\0\\0\\0\\1\\0\\0\end{pmatrix}$ | $\|110\rangle = \begin{pmatrix}0\\0\\0\\0\\0\\0\\1\\0\end{pmatrix}$ | $\|111\rangle = \begin{pmatrix}0\\0\\0\\0\\0\\0\\0\\1\end{pmatrix}$ |

Tensor-product or Kronecker-product in for three qubits (separable states):

$$\binom{a}{b} \otimes \binom{c}{d} \otimes \binom{e}{f} = \begin{pmatrix} ace \\ acf \\ ade \\ adf \\ bce \\ bcf \\ bde \\ bdf \end{pmatrix}$$

For your convenience I added the Kronecker-products for three qubits in the six basis states $|0\rangle, |1\rangle, |+\rangle, |-\rangle, (y+), (y-)$.

| | $\|..0\rangle$ | $\|..1\rangle$ | $\|..+\rangle$ | $\|..-\rangle$ | $\|..(y+)\rangle$ | $\|..(y-)\rangle$ |
|---|---|---|---|---|---|---|
| $\|00.\rangle$ | $\begin{pmatrix}1\\0\\0\\0\\0\\0\\0\\0\end{pmatrix}$ | $\begin{pmatrix}0\\1\\0\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\1\\0\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\-1\\0\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\i\\0\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\-i\\0\\0\\0\\0\\0\\0\end{pmatrix}$ |
| $\|01.\rangle$ | $\begin{pmatrix}0\\0\\1\\0\\0\\0\\0\\0\end{pmatrix}$ | $\begin{pmatrix}0\\0\\0\\1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\-1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\-i\\0\\0\\0\\0\end{pmatrix}$ |
| $\|0+.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\1\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\1\\1\\1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\1\\-1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\1\\i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\1\\-i\\0\\0\\0\\0\end{pmatrix}$ |
| $\|0-.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\-1\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\-1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\1\\-1\\-1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\-1\\1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\-1\\-i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\-1\\i\\0\\0\\0\\0\end{pmatrix}$ |
| $\|0(y+).\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\i\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\1\\i\\i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\i\\-i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\i\\-1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\i\\1\\0\\0\\0\\0\end{pmatrix}$ |
| $\|0(y-).\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\-i\\0\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\-i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\-i\\i\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\-i\\1\\0\\0\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\-i\\-1\\0\\0\\0\\0\end{pmatrix}$ |

| | $\|..0\rangle$ | $\|..1\rangle$ | $\|..+\rangle$ | $\|..-\rangle$ | $\|..(y+)\rangle$ | $\|..(y-)\rangle$ |
|---|---|---|---|---|---|---|
| $\|10.\rangle$ | $\begin{pmatrix}0\\0\\0\\0\\1\\0\\0\\0\end{pmatrix}$ | $\begin{pmatrix}0\\0\\0\\0\\0\\1\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\1\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\-1\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\i\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\-i\\0\\0\end{pmatrix}$ |
| $\|11.\rangle$ | $\begin{pmatrix}0\\0\\0\\0\\0\\0\\1\\0\end{pmatrix}$ | $\begin{pmatrix}0\\0\\0\\0\\0\\0\\0\\1\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\0\\1\\1\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\0\\1\\-1\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\0\\1\\i\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\0\\1\\-i\end{pmatrix}$ |
| $\|1+.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\0\\1\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\1\\0\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\1\\1\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-1\\1\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\i\\1\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-i\\1\\-i\end{pmatrix}$ |
| $\|1-.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\0\\-1\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\1\\0\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\1\\-1\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-1\\-1\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\i\\-1\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-i\\-1\\i\end{pmatrix}$ |
| $\|1(y+).\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\0\\i\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\1\\0\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\1\\i\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-1\\i\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\i\\i\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-i\\i\\1\end{pmatrix}$ |
| $\|1(y-).\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\1\\0\\-i\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\0\\0\\1\\0\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\1\\-i\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-1\\-i\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\i\\-i\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\0\\0\\1\\-i\\-i\\-1\end{pmatrix}$ |

| | $\|..0\rangle$ | $\|..1\rangle$ | $\|..+\rangle$ | $\|..-\rangle$ | $\|..(y+)\rangle$ | $\|..(y-)\rangle$ |
|---|---|---|---|---|---|---|
| $\|+0.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\0\\0\\1\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\0\\0\\1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\1\\0\\0\\1\\1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\0\\0\\1\\-1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\0\\0\\1\\i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\0\\0\\1\\-i\\0\\0\end{pmatrix}$ |
| $\|+1.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\0\\0\\0\\1\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\1\\0\\0\\0\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\1\\0\\0\\1\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-1\\0\\0\\1\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\i\\0\\0\\1\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-i\\0\\0\\1\\-i\end{pmatrix}$ |
| $\|++.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\1\\0\\1\\0\\1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\1\\0\\1\\0\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\1\\1\\1\\1\\1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\1\\-1\\1\\-1\\1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\1\\i\\1\\i\\1\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\1\\-i\\1\\-i\\1\\-i\end{pmatrix}$ |
| $\|+-.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-1\\0\\1\\0\\-1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-1\\0\\1\\0\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-1\\-1\\1\\1\\-1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-1\\1\\1\\-1\\-1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-1\\-i\\1\\i\\-1\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-1\\i\\1\\-i\\-1\\i\end{pmatrix}$ |
| $\|+(y+).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\i\\0\\1\\0\\i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\i\\0\\1\\0\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\i\\i\\1\\1\\i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\i\\-i\\1\\-1\\i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\i\\-1\\1\\i\\i\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\i\\1\\1\\-i\\i\\1\end{pmatrix}$ |
| $\|+(y-).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-i\\0\\1\\0\\-i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-i\\0\\1\\0\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-i\\-i\\1\\1\\-i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-i\\i\\1\\-1\\-i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-i\\1\\1\\i\\-i\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-i\\-1\\1\\-i\\-i\\-1\end{pmatrix}$ |

| | $\|..0\rangle$ | $\|..1\rangle$ | $\|..+\rangle$ | $\|..-\rangle$ | $\|..(y+)\rangle$ | $\|..(y-)\rangle$ |
|---|---|---|---|---|---|---|
| $\|-0.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\0\\0\\-1\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\0\\0\\-1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\1\\0\\0\\-1\\-1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\0\\0\\-1\\1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\0\\0\\-1\\-i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\0\\0\\-1\\i\\0\\0\end{pmatrix}$ |
| $\|-1.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\0\\0\\0\\-1\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\1\\0\\0\\0\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\1\\0\\0\\-1\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-1\\0\\0\\-1\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\i\\0\\0\\-1\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-i\\0\\0\\-1\\i\end{pmatrix}$ |
| $\|-+.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\1\\0\\-1\\0\\-1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\1\\0\\-1\\0\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\1\\1\\-1\\-1\\-1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\1\\-1\\-1\\1\\-1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\1\\i\\-1\\-i\\-1\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\1\\-i\\-1\\i\\-1\\i\end{pmatrix}$ |
| $\|--.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-1\\0\\-1\\0\\1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-1\\0\\-1\\0\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-1\\-1\\-1\\-1\\1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-1\\1\\-1\\1\\1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-1\\-i\\-1\\-i\\1\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-1\\i\\-1\\i\\1\\-i\end{pmatrix}$ |
| $\|-(y+).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\i\\0\\-1\\0\\-i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\i\\0\\-1\\0\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\i\\i\\-1\\-1\\-i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\i\\-i\\-1\\1\\-i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\i\\-1\\-1\\-i\\-i\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\i\\1\\-1\\i\\-i\\-1\end{pmatrix}$ |
| $\|-(y-).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-i\\0\\-1\\0\\i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-i\\0\\-1\\0\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-i\\-i\\-1\\-1\\i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-i\\i\\-1\\1\\i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-i\\1\\-1\\-i\\i\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-i\\-1\\-1\\i\\i\\1\end{pmatrix}$ |

| | $\|..0\rangle$ | $\|..1\rangle$ | $\|..+\rangle$ | $\|..-\rangle$ | $\|..(y+)\rangle$ | $\|..(y-)\rangle$ |
|---|---|---|---|---|---|---|
| $\|(y+)0.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\0\\0\\i\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\0\\0\\i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\1\\0\\0\\i\\i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\0\\0\\i\\-i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\0\\0\\i\\-1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\0\\0\\i\\1\\0\\0\end{pmatrix}$ |
| $\|(y+)1.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\0\\0\\0\\i\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\1\\0\\0\\0\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\1\\0\\0\\i\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-1\\0\\0\\i\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\i\\0\\0\\i\\-1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-i\\0\\0\\i\\1\end{pmatrix}$ |
| $\|(y+)+.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\1\\0\\i\\0\\i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\1\\0\\i\\0\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\1\\1\\i\\i\\i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\1\\-1\\i\\-i\\i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\1\\i\\i\\-1\\i\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\1\\-i\\i\\1\\i\\1\end{pmatrix}$ |
| $\|(y+)-.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-1\\0\\i\\0\\-i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-1\\0\\i\\0\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-1\\-1\\i\\i\\-i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-1\\1\\i\\-i\\-i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-1\\-i\\i\\-1\\-i\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-1\\i\\i\\1\\-i\\-1\end{pmatrix}$ |
| $\|(y+)(y+).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\i\\0\\i\\0\\-1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\i\\0\\i\\0\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\i\\i\\i\\i\\-1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\i\\-i\\i\\-i\\-1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\i\\-1\\i\\-1\\-1\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\i\\1\\i\\1\\-1\\i\end{pmatrix}$ |
| $\|(y+)(y-).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-i\\0\\i\\0\\1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-i\\0\\i\\0\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-i\\-i\\i\\i\\1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-i\\i\\i\\-i\\1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-i\\1\\i\\-1\\1\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-i\\-1\\i\\1\\1\\-i\end{pmatrix}$ |

| | $\|..0\rangle$ | $\|..1\rangle$ | $\|..+\rangle$ | $\|..-\rangle$ | $\|..(y+)\rangle$ | $\|..(y-)\rangle$ |
|---|---|---|---|---|---|---|
| $\|(y-)0.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}1\\0\\0\\0\\-i\\0\\0\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\0\\0\\0\\-i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\1\\0\\0\\-i\\-i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-1\\0\\0\\-i\\i\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\i\\0\\0\\-i\\1\\0\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}1\\-i\\0\\0\\-i\\-1\\0\\0\end{pmatrix}$ |
| $\|(y-)1.\rangle$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\1\\0\\0\\0\\-i\\0\end{pmatrix}$ | $\frac{1}{\sqrt{2}}\begin{pmatrix}0\\0\\0\\1\\0\\0\\0\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\1\\0\\0\\-i\\-i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-1\\0\\0\\-i\\i\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\i\\0\\0\\-i\\1\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\0\\1\\-i\\0\\0\\-i\\-1\end{pmatrix}$ |
| $\|(y-)+.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\1\\0\\-i\\0\\-i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\1\\0\\-i\\0\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\1\\1\\-i\\-i\\-i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\1\\-1\\-i\\i\\-i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\1\\i\\-i\\1\\-i\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\1\\-i\\-i\\-1\\-i\\-1\end{pmatrix}$ |
| $\|(y-)-.\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-1\\0\\-i\\0\\i\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-1\\0\\-i\\0\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-1\\-1\\-i\\-i\\i\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-1\\1\\-i\\i\\i\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-1\\-i\\-i\\1\\i\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-1\\i\\-i\\-1\\i\\1\end{pmatrix}$ |
| $\|(y-)(y+).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\i\\0\\-i\\0\\1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\i\\0\\-i\\0\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\i\\i\\-i\\-i\\1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\i\\-i\\-i\\i\\1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\i\\-1\\-i\\1\\1\\i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\i\\1\\-i\\-1\\1\\-i\end{pmatrix}$ |
| $\|(y-)(y-).\rangle$ | $\frac{1}{2}\begin{pmatrix}1\\0\\-i\\0\\-i\\0\\-1\\0\end{pmatrix}$ | $\frac{1}{2}\begin{pmatrix}0\\1\\0\\-i\\0\\-i\\0\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\1\\-i\\-i\\-i\\-i\\-1\\-1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-1\\-i\\i\\-i\\i\\-1\\1\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\i\\-i\\1\\-i\\1\\-1\\-i\end{pmatrix}$ | $\frac{1}{2^{\frac{3}{2}}}\begin{pmatrix}1\\-i\\-i\\-1\\-i\\-1\\-1\\i\end{pmatrix}$ |