Example

Convert the point \( (3, -\frac{3\pi}{4}) \) (given in polar coordinates) to Cartesian coordinates.

To convert from polar coordinates to Cartesian coordinates, use the relations \( x = r \cos \theta \) and \( y = r \sin \theta \).

For \( (r, \theta) = \left(3, -\frac{3\pi}{4}\right) \),

\[
x = 3 \cos \frac{-3\pi}{4} = -\frac{3\sqrt{2}}{2}
\]

\[
y = 3 \sin \frac{-3\pi}{4} = -\frac{3\sqrt{2}}{2}
\]

Therefore this point has Cartesian coordinates \((x, y) = \left(-\frac{3\sqrt{2}}{2}, -\frac{3\sqrt{2}}{2}\right)\).