Conversion between Phasor and Rectangular Coordinates
Rectangular Coordinates to Phasor

\[ x + jy = P_M \angle \phi \]

\[ P_M = \sqrt{x^2 + y^2} \]

\[ \phi = \alpha \tan \frac{y}{x} \]

- \( x \) and \( y \) are the coefficients of the real and imaginary components in rectangular coordinates.
- \( P_M \) is the magnitude of the phasor and \( \phi \) is the phase angle.
  - The phasor magnitude will always be positive.
  - The sign of the real and imaginary component should be kept when calculating the phase angle. It is the angle that carries the information about the sign of \( x \) and \( y \).
Phasor to Rectangular Coordinates

\[ P_M \angle \phi = x + jy \]
\[ x = P_M \cos(\phi) \]
\[ y = P_M \sin(\phi) \]

- Phase angle is written in degrees so make sure that the argument of the sine and cosine are formatted correctly.