CONVERSION BETWEEN 2-DIMENSIONAL COORDINATES

	Cartesian	Polar
Cartesian		$x = r\cos\theta$ $y = r\sin\theta$
Polar	$r = \sqrt{x^2 + y^2}$ $\tan\theta = y/x$	

$$
\theta = \begin{cases}
\tan^{-1}(y/x) & \textbf{if} \quad x > 0,\, y \geq 0 \\
\tan^{-1}(y/x) + 2\pi & \textbf{if} \quad x > 0,\, y < 0 \\
\tan^{-1}(y/x) + \pi & \textbf{if} \quad x < 0 \\
\pi/2 & \textbf{if} \quad x = 0,\, y > 0 \\
3\pi/2 & \textbf{if} \quad x = 0,\, y < 0 \\
\text{indeterminate} & \textbf{if} \quad x = y = 0
\end{cases}
$$