# Macros for using complex numbers with j

The imaginary unit is: j.

Set the imaginary unit with: `\renewcommand{\imaginaryunit}{j}` (default)

In math-mode: j. Use in math-mode: `\imunit`

The constant e in math-mode e. Use in math-mode: `\ce`

Real power of e: $\mathrm{e}^{-2} = 0,13533528\ldots$ Use in math-mode: `\epowre{arg}`

Imaginary power of e: $\mathrm{e}^{\mathrm{j}\alpha}$. Use in math-mode: `\epowim{arg}`

Goniometic complex: $\cos\alpha + \mathrm{j}\sin\alpha$. Use in math-mode: `\cis{\alpha}`

Goniometic complex: $\cos\alpha - \mathrm{j}\sin\alpha$. Use in math-mode: `\cis{-\alpha}`

Goniometic complex: $\cos\omega t + \mathrm{j}\sin\omega t$. Use in math-mode: `\cis{\omega t}}`

Goniometic complex: $\cos\omega t - \mathrm{j}\sin\omega t$. Use in math-mode: `\cis{-{\omega t}}`

Goniometic complex: $\cos -\omega t + \mathrm{j}\sin -\omega t$. Use in math-mode: `\cis{{-\omega t}}`

Complex power of e: $\mathrm{e}^{\sigma+\mathrm{j}\omega t}$. Use in math-mode: `\epowcom{\sigma}{\omega t}`

Complex power of e: $\mathrm{e}^{\sigma-\mathrm{j}\omega t}$. Use in math-mode: `\epowcom{\sigma}{-\omega t}`

Together: $\mathrm{e}^{\sigma+\mathrm{j}\omega t} = \mathrm{e}^{\sigma}(\cos\omega t + \mathrm{j}\sin\omega t)$

Together: $\mathrm{e}^{\sigma-\mathrm{j}\omega t} = \mathrm{e}^{\sigma}(\cos\omega t - \mathrm{j}\sin\omega t)$

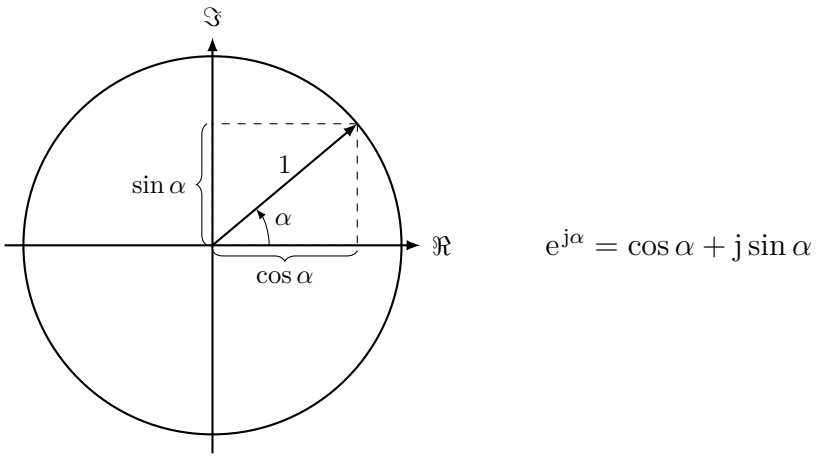



Figure 1: Complex unit circle.

# Macros for using complex numbers with i

The imaginary unit is: i.

Set the imaginary unit with: `\renewcommand{\imaginaryunit}{i}`

In math-mode: i. Use in math-mode: `\imunit`

The constant e in math-mode e. Use in math-mode: `\ce`

Real power of e: $\mathrm{e}^{-2} = 0,13533528\ldots$ Use in math-mode: `\epowre{arg}`

Imaginary power of e: $\mathrm{e}^{\mathrm{i}\alpha}$. Use in math-mode: `\epowim{arg}`

Goniometic complex: $\cos\alpha + \mathrm{i}\sin\alpha$. Use in math-mode: `\cis{\alpha}`

Goniometic complex: $\cos\alpha - \mathrm{i}\sin\alpha$. Use in math-mode: `\cis{-\alpha}`

Goniometic complex: $\cos\omega t + \mathrm{i}\sin\omega t$. Use in math-mode: `\cis{\omega t}}`

Goniometic complex: $\cos\omega t - \mathrm{i}\sin\omega t$. Use in math-mode: `\cis{-{\omega t}}`

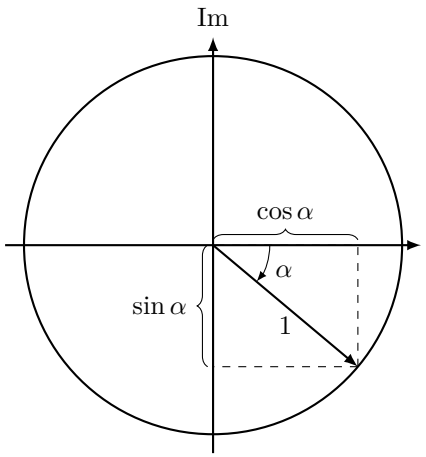
Goniometic complex: $\cos -\omega t + \mathrm{i}\sin -\omega t$. Use in math-mode: `\cis{{-\omega t}}`

Complex power of e: $\mathrm{e}^{\sigma+\mathrm{i}\omega t}$. Use in math-mode: `\epowcom{\sigma}{\omega t}`

Complex power of e: $\mathrm{e}^{\sigma-\mathrm{i}\omega t}$. Use in math-mode: `\epowcom{\sigma}{-\omega t}`

Together: $\mathrm{e}^{\sigma+\mathrm{i}\omega t} = \mathrm{e}^{\sigma}(\cos\omega t + \mathrm{i}\sin\omega t)$

Together: $\mathrm{e}^{\sigma-\mathrm{i}\omega t} = \mathrm{e}^{\sigma}(\cos\omega t - \mathrm{i}\sin\omega t)$




$\mathrm{e}^{-\mathrm{i}\alpha} = \cos\alpha - \mathrm{i}\sin\alpha$

Figure 2: Complex unit circle.