1.12 Complex numbers

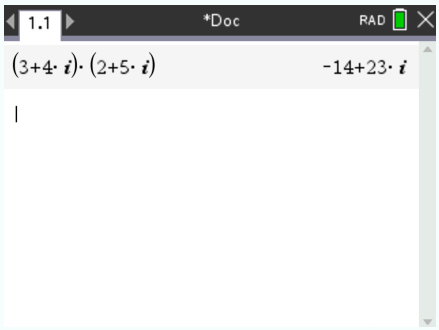
To write the imaginary unit i, press π and select i.

1.12.1 Operations on complex numbers

Consider the complex numbers $3+4i$ and $2+5i$.

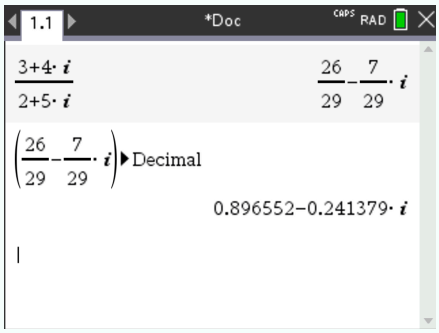
Suppose you want to add them. For this, just add them as you would add real numbers. The result should be $5+9i$.

Suppose you want to multiply them. For this, put each of them in brackets and multiply each bracket:



Press enter. The result should be $-14+23i$.

Suppose you have to divide them. For this, press $\frac{a}{b}$ and select $\frac{\square}{\square}$ to display a fraction, and put the numbers in each part of the fraction:



Press enter. The result should be about $0.897-0.241i$, or $\frac{26}{29}-\frac{7}{29}i$. If you want to switch from fraction to decimal writing, press menu and select Number > Convert to Decimal.

1.12.2 Solve polynomial equations (complex solutions)

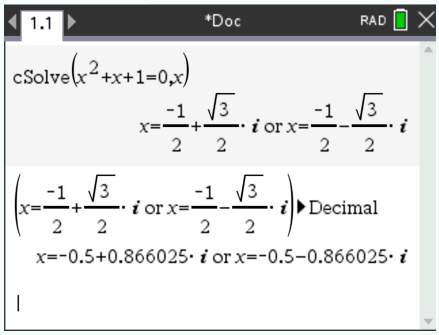
Suppose you have to solve the equation $x^2 + x + 1 = 0$.

> The right hand side must be 0

① Press menu, select Algebra > Complex > Solve. Then **csolve()** is displayed.

② Between the brackets, enter the equation and the variable of interest after a comma.

③ Press enter and the solutions are displayed.



The results should be $x_1 = -\frac{1}{2} + \frac{\sqrt{3}}{2}i$ and $x_2 = -\frac{1}{2} - \frac{\sqrt{3}}{2}i$, or $x_1 = -0.5 + 0.866i$ and $x_2 = 0.5 + 0.866i$ (decimal form rounded).

To change from fraction to decimal, press menu and select Number > Convert to Decimal.