

Chapter 10 / **Example 3****Cartesian and polar form**

Write the following complex numbers in Cartesian form. Check your answer by using technology.

a $2\text{cis}\frac{\pi}{3}$ **b** $5e^{i\frac{3\pi}{4}}$ **c** $8\text{cis}\frac{11\pi}{6}$ **d** $e^{i\frac{17\pi}{12}}$

Open a new document and add a Calculator page.

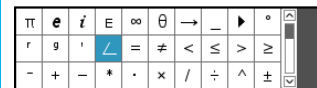
Complex numbers can be entered in polar form.

Open parentheses and type 2.

Press **ctrl** **[]** **[\angle]** and select **[\angle]**.

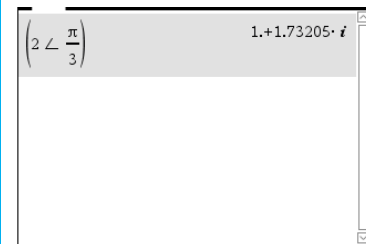
Type $\frac{\pi}{3}$ using the fraction template **ctrl** **[$\frac{\square}{\square}$]** (**[$\frac{\square}{\square}$]**).

Press **enter**.



Since the default format of complex numbers is Cartesian, the GDC converts from polar to Cartesian without needing to enter any additional command.

$$2\text{cis}\frac{\pi}{3} = 1 + 1.73i.$$

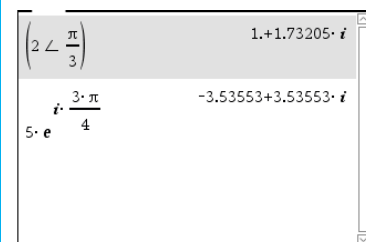


To enter a complex number in Euler's form, use **[e^x]**.

Type $5e^{i\frac{3\pi}{4}}$ and press **enter**.

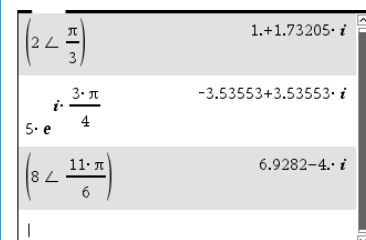
Use the fraction template **ctrl** **[$\frac{\square}{\square}$]** (**[$\frac{\square}{\square}$]**) and enter i by pressing **[π]** and selecting **i** from the menu.

$$5e^{i\frac{3\pi}{4}} = -3.54 + 3.54i.$$



Open parentheses, type $8\angle\frac{11\pi}{6}$ and press **enter**.

$$8\text{cis}\frac{11\pi}{6} = 6.93 - 4i.$$



Chapter 10 / **Example 3**

Cartesian and polar form

Type $e^{i \frac{17\pi}{12}}$ and press **enter**.

$$e^{i \frac{17\pi}{12}} = -0.259 - 0.966i.$$

The calculator screen shows the input $e^{i \frac{17\pi}{12}}$ and the result $-0.258819 - 0.965926i$. Above this, there is a line showing $5 \cdot e^{i \frac{3\pi}{4}}$ with a result of $-3.53553 + 3.53553i$. Below that, a line shows $\left(8 \angle \frac{11\pi}{6}\right)$ with a result of $6.9282 - 4i$.