Chapter 8 / **Example 8**

Converting complex number forms

a Write the complex number 2 + 3i in modulus argument form.

b Find in the form *a* + *b*i the complex numbers with the following modulus (*r*) and argument (θ) values.

i $r = 3, \theta = 0.4$ **ii** $r = 5, \theta = 3.4$

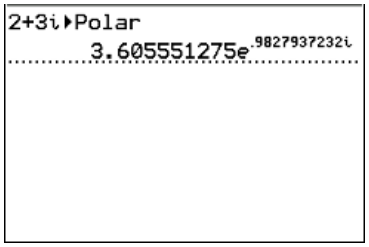
The TI-84 Plus C will find polar form directly.

Type $2 + 3\text{i}$

Press MATH ▸ ▸ CMPLX 7:▸ Polar and press ENTER.

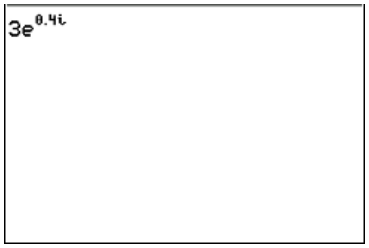
To enter i press 2nd . [i].

$2 + 3\text{i} = 3.61\text{e}^{0.983\text{i}} = 3.61\text{cis}\,0.983$



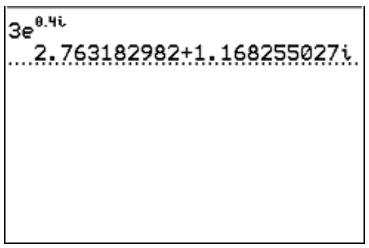
On the TI-84 Plus C complex numbers cannot be entered in polar form, just in Euler's form, therefore you should rewrite $3\text{cis}\,0.4$ as $3e^{0.4i}$.

Type $3e^{0.4i}$ using 2nd LN [e^x] and press ENTER.



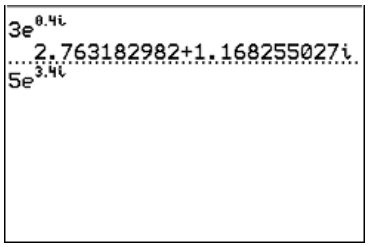
Since the default format of complex numbers is Cartesian, the GDC converts from polar to Cartesian without needing to enter any additional command.

$3\text{cis}\,0.4 = 2.76 + 1.17\text{i}$



Rewrite $5\text{cis}\,3.4$ as $5e^{3.4i}$.

Type $5e^{3.4i}$ using 2nd LN [e^x] and press ENTER.



$5\text{cis}\,3.4 = -4.83 - 1.28\text{i}$