

Chapter 3 / **Example 19****Powers of a complex number**

Given the complex number $z = 2 + i$, find each of these expressions. Check your answer with a calculator.

a z^3

b $(z^*)^5$

c $(z^5)^*$

Press **MENU** 1 **RUN-MAT** to display the Run-Matrix screen for arithmetical calculations.

To store a value press **→**.

Type $2 + i$ and store it as Z.

To enter i press **SHIFT** 0 **i**

Press **EXE**.

2+i→Z
2+i
DEL-LINE DEL-ALL

To calculate z^3 type $z \wedge 3$ and press **EXE**.

$z^3 = 2 - 11i$

2+i→Z
2+i
Z^3
2+11i
JUMP DELETE MAT/VCT MATH

To calculate $(z^*)^5$ type (and press **OPTN** **F3** **COMPLEX** **F4** **Conjg**.

Type Z and close the parenthesis.

Type $\wedge 5$ and press **EXE**.

$(z^*)^5 = -38 - 41i$

2+i→Z
2+i
Z^3
2+11i
(Conjg Z)^5
-38-41i
i Abs Arg Conjg

To calculate $(z^5)^*$ press **F4** **Conjg**.

Type $Z \wedge 5$ and press **EXE**.

$(z^5)^* = -38 - 41i$

2+i→Z
2+i
Z^3
2+11i
(Conjg Z)^5
-38-41i
Conjg Z^5
-38-41i
i Abs Arg Conjg