

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**  $(z^5)^*$

To store a value press **STO►**.

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

To enter i press **2nd** **□** **[i]**.

Press **ENTER**.

```

2+i→Z
2+i

```

To calculate  $z^3$  type  $Z^3$  and press **ENTER**

$z^3 = 2 + 11i$

```

2+i→Z
2+i
Z^3
2+11i

```

To calculate  $z^*$  type  $($  and press **MATH** **►** **►** **CMPLX 1:conj(**

Type Z and type  $)$  to close both sets of parentheses.

Type  $^5$  and press **ENTER**.

$z^*{}^5 = -38 - 41i$

```

2+i→Z
2+i
Z^3
2+11i
(conj(Z))^5
-38-41i

```

To calculate  $z^5$  \* press **MATH** **►** **►** **CMPLX 1:conj(**

Type  $Z^5$  press **►** close the parentheses and press **ENTER**.

$z^5{}^* = -38 - 41i$

```

2+i→Z
2+i
Z^3
2+11i
(conj(Z))^5
-38-41i
conj(Z^5)
-38-41i

```