

Chapter 3 / Example 14

Operations with complex numbers

Storing values of complex numbers for ease of calculation.

Given the complex numbers $z_1 = 1 - 3i$, $z_2 = 4 + i$ and $z_3 = -2 + 3i$, find the following.

a $z_1 \cdot z_2 - z_3$ **b** $z_1 \cdot z_2 \cdot z_3$ **c** $z_1^2 + 2z_2 \cdot z_3$

Check your answers on your GDC.

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

To store a value press **→** **□**

Type $1 - 3i$ and store it as P .

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

Press **EXE**.

```
1-3i→P          1-3i
□
DEL-LINE DEL-ALL
```

In the same way, store $4 + i$ as Q and $-2 + 3i$ as R .

```
1-3i→P          1-3i
4+i→Q           4+i
-2+3i→R         -2+3i
□
DEL-LINE DEL-ALL
```

To calculate $z_1 \cdot z_2 - z_3$ type $P \times Q - R$ and press **EXE**.

$$z_1 \cdot z_2 - z_3 = 9 - 14i$$

```
1-3i→P          1-3i
4+i→Q           4+i
-2+3i→R         -2+3i
□
DEL-LINE DEL-ALL
```

To calculate $z_1 \cdot z_2 \cdot z_3$ type $P \times Q \times R$ and press **EXE**.

$$z_1 \cdot z_2 \cdot z_3 = 19 + 43i$$

```
-2+3i→R         -2+3i
P×Q-R           9-14i
P×Q×R          19+43i
□
DEL-LINE DEL-ALL
```

To calculate $z_1^2 + 2z_2 \cdot z_3$ type $P^2 + 2Q \times R$ and press **EXE**.

$$z_1^2 + 2z_2 \cdot z_3 = -30 + 14i$$

```
P×Q-R           9-14i
P×Q×R          19+43i
P²+2Q×R        -30+14i
□
DEL-LINE DEL-ALL
```