



# Multiplication with Complex Numbers

## Worksheet 1

*Answer each of the following without a calculator, using the boxes provided for your answers.*

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### Question 1

Expand and simplify:

$$(1 + 3i) \cdot (5 + 2i)$$

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### Question 2

Expand and simplify:

$$(3 - 4i) \cdot (2 + 6i)$$



### Question 3

Given  $z_1 = 3 - 4i$  and  $z_2 = 1 + 5i$ , find:

$$2 \cdot z_2 - z_1 \cdot z_1^*$$

### Question 4

Expand and simplify:

$$(2 - i) \cdot (6 - 3i)$$



### Question 5

Given  $z_1 = 3i$  and  $z_2 = 7 + i$ , find:

$$3 \cdot z_1 \cdot z_1^* + z_2 \cdot z_2^*$$

### Question 6

Expand and simplify:

$$(5 + 3i) \cdot (7 + i)$$



### Question 7

Given  $z_1 = 5 + 2i$  and  $z_2 = 1 + i$ , find:

$$4 \cdot z_1 (z_1^* - z_2)$$

### Question 8

Expand and simplify:

$$(-2 + 5i) \cdot (3 - 2i)$$



## Question 9

Given  $z_1 = -4 + i$  and  $z_2 = 6 + 7i$ , find:

$$(z_1 + z_2) \cdot (z_1^* - z_2^*)$$

## Question 10

Find:

$$2 \cdot z_1 + z_2 \cdot z_3$$

where  $z_1 = 1 + 2i$ ,  $z_2 = 2 + 4i$  and  $z_3 = 3 - i$



### Question 11

Find:

$$z_1 \cdot z_2 - 4z_3$$

Where  $z_1 = 2 + i$ ,  $z_2 = 3 - i$  and  $z_3 = 3 + 2i$ .

### Question 12

Find:

$$3z_1 \cdot z_2 - 2z_3$$

Where  $z_1 = 5 + 2i$ ,  $z_2 = 2 - 3i$  and  $z_3 = 6 + 4i$ .