

1.2) Multiplying complex numbers

Worked example

Determine the value of:

$$i^2$$

$$i^3$$

$$i^4$$

$$(3i)^5$$

Your turn

Determine the value of:

$$i^{10}$$

$$-1$$

$$i^7$$

$$-i$$

$$i^{40}$$

$$1$$

$$(2i)^5$$

$$32i$$

Worked example

Determine the value of:

$$i^{101}$$

$$i^{202}$$

$$i^{3003}$$

Your turn

Determine the value of:

$$i^{10007}$$

$$-i$$

Worked example

Express each of the following in the form $a + bi$, where a, b are integers:

$$(2 + 3i)(2 - 3i)$$

$$(2 + 3i)(3 + 2i)$$

$$(2 - 3i)^2$$

Your turn

Express each of the following in the form $a + bi$, where a, b are integers:

$$(4 + 5i)(4 - 5i)$$

$$29$$

$$(4 + 5i)(5 + 4i)$$

$$41i$$

$$(4 - 5i)^2$$

$$41 - 40i$$

Worked example

Simplify, giving your answer in the form $a + bi$:

$$(1 + i)^3$$

$$(1 + i)^4$$

Your turn

Simplify, giving your answer in the form $a + bi$:

$$(1 + i)^5$$

$$-4 - 4i$$

Worked example

Given that

$$(a + 5i)(1 + bi) = 38 - 16i,$$

find the possible values of a and b

Your turn

Given that

$$(a + 5i)(1 + bi) = 22 - 16i,$$

find the values of a and b

$$a = 7, b = -3$$

$$a = 15, b = -\frac{7}{5}$$