

## Watch. Practice. Understand. | Lesson 089

Complex Numbers with Addition, Subtraction, Multiplication and Division and  $i$  cycle

Watch the matching video: <https://www.youtube.com/watch?v=1tyAk-2CF9U>

Practice focus: Complex numbers

Original extra practice matched to the listed lesson topic.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning and check units.

**01** Simplify  $(3 + 2i) + (5 - 7i)$ .

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**02** Multiply  $(2 + 3i)(4 - i)$ .

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**03** Simplify  $(3 + i)/(1 - i)$ .

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**04** Evaluate  $i^{37}$  and solve  $x^2 + 16 = 0$ .

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## Worked answers | Lesson 089

Complex Numbers with Addition, Subtraction, Multiplication and Division and  $i$  cycle

Watch the matching video: <https://www.youtube.com/watch?v=1tyAk-2CF9U>

Practice focus: Complex numbers

Original extra practice matched to the listed lesson topic.

**01** Simplify  $(3 + 2i) + (5 - 7i)$ .

Combine real and imaginary parts:  $8 - 5i$ .

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**02** Multiply  $(2 + 3i)(4 - i)$ .

$$8 - 2i + 12i - 3i^2 = 11 + 10i.$$

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**03** Simplify  $(3 + i)/(1 - i)$ .

Multiply top and bottom by  $1 + i$ :  $(2 + 4i)/2 = 1 + 2i$ .

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**04** Evaluate  $i^{37}$  and solve  $x^2 + 16 = 0$ .

37 leaves remainder 1 on division by 4, so  $i^{37} = i$ . The equation gives  $x = \pm 4i$ .