

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

Lesson 089 | Algebra II | Complex numbers

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

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 Simplify $(3 + 13i)/(1 - 4i)$.

02 Write $(11 + 8i)(14 - 4i)$ in $a + bi$ form.

03 Write $(3 + 13i)(8 - 7i)$ in $a + bi$ form.

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04

Simplify $(4 + 10i)/(1 - 2i)$.

05

Write $(7 + 5i)(12 - 4i)$ in $a + bi$ form.

06

Write $(10 + 6i)(5 - 2i)$ in $a + bi$ form.

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01 Simplify $(3 + 13i)/(1 - 4i)$.

Multiply numerator and denominator by $1+4i$. Denominator $1+16=17$. Numerator $(-49) + (25)i$. Result $-49/17 + 25i/17$.

02 Write $(11 + 8i)(14 - 4i)$ in $a + bi$ form.

Distribute and use $i^2=-1$: real part $154+32=186$; imaginary coefficient $112-44=68$. Result $186 + 68i$.

03 Write $(3 + 13i)(8 - 7i)$ in $a + bi$ form.

Distribute and use $i^2=-1$: real part $24+91=115$; imaginary coefficient $104-21=83$. Result $115 + 83i$.

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04 Simplify $(4 + 10i)/(1 - 2i)$.

Multiply numerator and denominator by $1+2i$. Denominator $1+4=5$. Numerator $(-16) + (18)i$.
Result $-16/5 + 18i/5$.

05 Write $(7 + 5i)(12 - 4i)$ in $a + bi$ form.

Distribute and use $i^2=-1$: real part $84+20=104$; imaginary coefficient $60-28=32$. Result $104 + 32i$.

06 Write $(10 + 6i)(5 - 2i)$ in $a + bi$ form.

Distribute and use $i^2=-1$: real part $50+12=62$; imaginary coefficient $30-20=10$. Result $62 + 10i$.