LESSON MAKER PRO

Complex Move Mix

Add, subtract, and multiply complex numbers.

HIGH SCHOOL · A2S.NQ.A.1.a

A2S.NQ.A.1.a "Add, subtract, and multiply complex numbers using the commutative, associative, and distributive properties."

NAME _____ DATE _____

COMBINE AND DISTRIBUTE

To add or subtract complex numbers, combine the real parts and combine the imaginary parts. To multiply, distribute each term, replace i^2 with -1, and then combine like terms.

WORKED EXAMPLE

Multiply (11 + 13i)(7 - 9i).

1. Distribute: 77 - 99i + 91i - 117i^2.
2. Replace i^2 with -1: 77 - 99i + 91i + 117.
3. Combine like terms: 194 - 8i.

Answer: 194 - 8i

PRACTICE 6 problems

1 Add (4 + 2i) + (6 - 8i).

ANSWER _____

2 Subtract (8 - 6i) - (3 + 2i).

ANSWER _____

3 Multiply (2 + 3i)(4 + i).

ANSWER _____

4 Multiply (6 - 2i)(6 + 2i).

ANSWER _____

5 Add ((2 + i) + (3 - 4i)) + (4 + 2i).

ANSWER _____

6 Multiply (4 - 3i)(2 - 2i).

ANSWER _____

APPLY IT Show your work

1 In a game, the real part of a complex number shows horizontal movement, and the imaginary part shows vertical movement. Your character moves 4 + 2i, then -3 + 6i. What complex number represents the total movement?

WORK SPACE

ANSWER _____

2 A game places an icon at the complex-number position 3 + 4i. A visual effect multiplies its position by 1 + 2i. What is the icon's new position?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Calculate (2 + 3i)(4 - i) - (1 - 2i)(3 + i). Show the result of each multiplication before you subtract.

WORK SPACE AND ANSWER

ANSWER KEY

Complex Move Mix

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Add (4 + 2i) + (6 - 8i).	**10 - 6i**
2	Subtract (8 - 6i) - (3 + 2i).	**5 - 8i**
3	Multiply (2 + 3i)(4 + i).	**5 + 14i**
4	Multiply (6 - 2i)(6 + 2i).	**40**
5	Add ((2 + i) + (3 - 4i)) + (4 + 2i).	**9 - i**
6	Multiply (4 - 3i)(2 - 2i).	**2 - 14i**

PART 2 · APPLY IT

1. **1 + 8i** Add the movements: (4 + 2i) + (-3 + 6i) = 1 + 8i.
2. **-5 + 10i** Distribute: (3 + 4i)(1 + 2i) = 3 + 6i + 4i + $8i^2$. Since $i^2 = -1$, the new position is -5 + 10i.

CHALLENGE

(2 + 3i)(4 - i) = 11 + 10i and (1 - 2i)(3 + i) = 5 - 5i. Subtracting gives 6 + 15i.

Accept equivalent complex-number forms, such as 40 + 0i for problem 4. For the challenge, check both intermediate products as well as the final difference.