LESSON MAKER PRO

Conjugate Pairs

Find the partner of each complex number.

HIGH SCHOOL · MT.PLUS.NUM.REAS.2.b

MT.PLUS.NUM.REAS.2.b "Understand there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b as real numbers by: Finding the conjugate of a complex number."

NAME _____ DATE _____

THE CONJUGATE RULE

A complex number has the form a + bi, where a and b are real numbers. To find its conjugate, keep the real part a and change the sign of the imaginary part bi.

WORKED EXAMPLE

Find the conjugate of 8 + 13i.

1. Identify the real part, 8, and the imaginary part, 13i.
2. Keep 8 and change 13i to -13i.
3. Write the result as 8 - 13i.

Answer: 8 - 13i

PRACTICE 6 problems

1 Find the conjugate of 4 + 7i.

ANSWER _____

2 Find the conjugate of -5 + 2i.

ANSWER _____

3 Find the conjugate of 9 - 3i.

ANSWER _____

4 Find the conjugate of 15.

ANSWER _____

5 Find the conjugate of -12i.

ANSWER _____

6 Find the conjugate of 11/4 - 1/2i.

ANSWER _____

APPLY IT Show your work

1 A music app represents a sound filter's response with the complex number -6 - 10i. It uses the conjugate for a paired filter. What number represents the paired filter's response?

WORK SPACE

ANSWER _____

2 A game designer wants two animation settings to be complex conjugates. The settings are -4 + 3/5i and -4 - 3/5i. Are they conjugates? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Find the conjugate of the sum (3 + 4i) + (-7 + 6i). Then show that adding the conjugates of the two numbers gives the same result.

WORK SPACE AND ANSWER

ANSWER KEY

Conjugate Pairs

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the conjugate of 4 + 7i.	**4 - 7i**
2	Find the conjugate of -5 + 2i.	**-5 - 2i**
3	Find the conjugate of 9 - 3i.	**9 + 3i**
4	Find the conjugate of 15.	**15**
5	Find the conjugate of -12i.	**12i**
6	Find the conjugate of 11/4 - 1/2i.	**11/4 + 1/2i**

PART 2 · APPLY IT

1. **-6 + 10i** Keep the real part, -6, and change the sign of the imaginary part.
2. **Yes. Both have real part -4, and their imaginary parts have opposite signs.** The conjugate of -4 + 3/5i is -4 - 3/5i, which matches the second setting.

CHALLENGE

The sum is -4 + 10i, so its conjugate is -4 - 10i. The separate conjugates are 3 - 4i and -7 - 6i; their sum is also -4 - 10i.

Accept equivalent complex-number forms, such as 0 + 12i for 12i. For the challenge, students should show both calculations.