

Name _____

Date _____

Multiplication of Complex Numbers - Step-by-Step Lesson

Find the product of the complex numbers:

a. $(4 + 5i) \times (3 + 2i)$



Explanation: The formula for the product of two complex numbers is:

$$(a + bi)(c + di) = a(c + di) + bi(c + di)$$

$$= ac + adi + bci + bdi^2$$

$$= ac + adi + bci + bd(-1)$$

$$= ac + adi + bci - bd$$

$$= (ac - bd) + (adi + bci)$$

$$= (ac - bd) + (ad + bc)i$$

Step 1) Place our numbers into this formula:

$$(4 + 5i) \times (3 + 2i) = 4(3 + 2i) + 5i(3 + 2i)$$

$$= 12 + 8i + 15i + 10i^2$$

$$= 12 + 23i + 10(-1) \quad i^2 \text{ becomes } -1.$$

$$= 2 + 23i$$

