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:

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

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

$= 12 + 23i + 10 (-1)$ $i^2$ becomes -1.

$= 2 + 23i$