Reteaching 5-6

Complex Numbers

OBJECTIVE: Adding, subtracting, and multiplying complex numbers	**MATERIALS:** None

- A *complex number* consists of a real part and an imaginary part. It is written in the form $a + bi$, where a and b are real numbers.

- When adding or subtracting complex numbers, you combine the real parts and then combine the imaginary parts.

- When multiplying complex numbers, use the Distributive Property.

- $i^2 = (\sqrt{-1})(\sqrt{-1}) = -1$ and $i = \sqrt{-1}$

Examples

Simplify $(3 - i) + (2 + 3i)$.

$(3 - i) + (2 + 3i)$

$= ③ - \boxed{i} + ② + \boxed{3i}$ ⟵ **Circle real parts. Put a square around imaginary parts.**

$= (3 + 2) + (-1 + 3)i$ ⟵ **Combine.**

$= 5 + 2i$

Simplify $(3 + 4i)(5 + 2i)$.

$(3 + 4i)(5 + 2i)$

$= 3(5) + 3(2i) + 4i(5) + 4i(2i)$ ⟵ **Use the Distributive Property.**

$= 15 + 6i + 20i + 8i^2$ ⟵ **Combine real parts and imaginary parts.**

$= 15 + 26i + 8(-1)$ ⟵ **Substitute $i^2 = -1$.**

$= 7 + 26i$

Exercises

Simplify each expression.

1. $2i + (-4 - 2i)$ **2.** $5i \cdot 12i$ **3.** $(2 + i)(2 - i)$

4. $(3 + i)(2 + i)$ **5.** $(4 + 3i)(1 + 2i)$ **6.** $3i(1 - 2i)$

7. $(6i)(-4i)$ **8.** $3i(4 - i)$ **9.** $3 - (-2 + 3i) + (-5 + i)$

10. $4i(6 - 2i)$ **11.** $2i + (3i)^2$ **12.** $(5 + 6i) + (-2 + 4i)$

13. $-14i(-4)$ **14.** $3i\sqrt{-6}$ **15.** $9(11 + 5i)$