

Name _____
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Date _____
Algebra II

Operations with Complex Numbers

Multiply the following pairs of complex numbers and express in a + bi form

1. $(5 - 2i) \cdot (2 - 3i)$

2. $(-2 + 2i) \cdot (8 - i)$

3. $(7 - 2i) \cdot (8 + 3i)$

4. $(6 - i) \cdot (8 - 5i)$

5. $(-2 + 9i) \cdot (6 + 8i)$

6. $(-7 + 2i) \cdot (7 + 6i)$

7. Given i is the imaginary unit, $(2 - yi)^2$ in simplest form is

- 1) $y^2 - 4yi + 4$
- 2) $-y^2 - 4yi + 4$
- 3) $-y^2 + 4$
- 4) $y^2 + 4$

8. The expression $(3 - 7i)^2$ is equivalent to

- 1) $-40 + 0i$
- 2) $-40 - 42i$
- 3) $58 + 0i$
- 4) $58 - 42i$

9. The expression $(x + i)^2 - (x - i)^2$ is equivalent to

- 1) 0
- 2) -2
- 3) $-2 + 4xi$
- 4) $4xi$

10. The expression $6xi^3(-4xi + 5)$ is equivalent to

- | | |
|--------------------|------------------------|
| 1) $2x - 5i$ | 3) $-24x^2 + 30x - i$ |
| 2) $-24x^2 - 30xi$ | 4) $26x - 24x^2i - 5i$ |

11. Which expression is equivalent to $(3k - 2i)^2$, where i is the imaginary unit?

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|---------------|----------------------|
| 1) $9k^2 - 4$ | 3) $9k^2 - 12ki - 4$ |
| 2) $9k^2 + 4$ | 4) $9k^2 - 12ki + 4$ |

12. If x is a real number, express $2xi(i - 4i^2)$ in simplest $a + bi$ form.

13. Express $(1 - i)^3$ in $a + bi$ form.

14. Simplify $xi(i - 7i)^2$, where i is the imaginary unit.

15. Write $(5 + 2yi)(4 - 3i) - (5 - 2yi)(4 - 3i)$ in $a + bi$ form, where y is a real number.