

Algebra: Operations with Complex Numbers

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DIRECTIONS

Simplify powers of i . Add, subtract, or multiply complex numbers. Simplify fully.

1 Simplify the power of i :

$$i^2$$

Answer: _____

2 Add the complex numbers:

$$(4 + 1i) + (3 - 4i)$$

Answer: _____

3 Solve:

$$x^2 + 9 = 0$$

Answer: _____

4 Add the complex numbers:

$$(-4 - 4i) + (-4 - 1i)$$

Answer: _____

5 Simplify the power of i :

$$i^7$$

Answer: _____

6 Multiply the complex numbers:

$$(0 - 1i)(2 - 1i)$$

Answer: _____

7 Add the complex numbers:

$$(-4 - 1i) + (0 + 1i)$$

Answer: _____

8 Solve:

$$x^2 + 25 = 0$$

Answer: _____

9 Multiply the complex numbers:

$$(-3 + 1i)(-2 - 3i)$$

Answer: _____

10 Simplify the power of i :

$$i^4$$

Answer: _____

Answer Key & Solutions

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TEACHER NOTES $i^2 = -1$, $i^3 = -i$, $i^4 = 1$, then cycles. For products: FOIL then replace $i^2 = -1$.

1 Simplify the power of i :

$$= -1$$
$$i^2$$

2 Add the complex numbers:

$$= 7 - 3i$$
$$(4 + 1i) + (3 - 4i)$$

3 Solve:

$$= x = \pm 3i$$
$$x^2 + 9 = 0$$

4 Add the complex numbers:

$$= -8 - 5i$$
$$(-4 - 4i) + (-4 - 1i)$$

5 Simplify the power of i :

$$= -i$$
$$i^7$$

6 Multiply the complex numbers:

$$= -1 - 2i$$
$$(0 - 1i)(2 - 1i)$$

7 Add the complex numbers:

$$= -4 + 0i$$
$$(-4 - 1i) + (0 + 1i)$$

8 Solve:

$$= x = \pm 5i$$
$$x^2 + 25 = 0$$

9 Multiply the complex numbers:

$$= 9 + 7i$$
$$(-3 + 1i)(-2 - 3i)$$

10 Simplify the power of i :

$$= 1$$
$$i^4$$