Operations with Complex Numbers

Simplify each expression. Identify matching answers between Column 1 and Column 2. Put the letter of the matching problem in the blank.

1. $(3 - 4i) + (2 + 5i)$ $\underline{5+i}$ Ⓘ

2. $(8 + 7i) - (5 + 9i)$ $\underline{3-2i}$ Ⓚ

$8+(7i)-5(-9i)$

3. $2i(6 - 7i)$ $\underline{14+12i}$ Ⓒ

$12i - 14i^2$

4. $-8i(2 + 7i) + 30i$ $\underline{56+14i}$ Ⓕ

$-(16i) - 56i^2 + (30i)$

5. $2i(7 + 3i) + 5(-5i)$ $\underline{-6-11i}$ Ⓐ

$14i + 6i^2 - 25i$

6. $5i^{27}$ $\underline{-5i}$ $5(i^2)^{13}i$ Ⓙ

7. $(1 - 4i)(3 - 3i)$ $\underline{-9-15i}$ Ⓓ

$3 - 3i - 12i + 12i^2$

8. $(1 - 5i)^2 - (8 - 4i)$ $\underline{-32-6i}$ Ⓖ

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

$1 - 10i + 25i^2 - 8 + 4i$

9. $\dfrac{10-2i}{i}$ $\underline{-2-10i}$ Ⓑ

$\dfrac{10i - 2i^2}{i^2}$ $\dfrac{10i+2}{-1}$ $-10i - 2$

10. Solve: $x^2 - 6x + 25 = 0$ $\underline{3\pm4i}$ Ⓛ

$\dfrac{-(-6)\pm\sqrt{36-4(1)(25)}}{2(1)} \rightarrow \dfrac{6\pm\sqrt{-64}}{2} \rightarrow \dfrac{6\pm8i}{2}$

$\boxed{3\pm4i}$

11. $\dfrac{4i}{-1+i}$ $\underline{2-2i}$ Ⓔ

$\dfrac{4i}{(-1+i)} \cdot \dfrac{(-1-i)}{(-1-i)} = \dfrac{-4i-4i^2}{1-i^2}$ $\dfrac{4-4i}{2}$

12. $i^2 + i^5 + 1$ $\underline{i}$ Ⓗ

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

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

$-1 + i + 1$

A. $(9 - 7i) - (15 + 4i)$

$-6 - 11i$

B. $(-7 - 3i) + (5 - 7i)$

$-2 - 10i$

C. $3i(4 - 5i) - 1$

$12i - 15i^2 - 1 \rightarrow 12i + 15 - 1$

$14 + 12i$

D. $-2(3 - 4i) - (3 + 23i)$

$-6 + 8i - 3 - 23i$ $-9 - 15i$

E. $3i(7 - 2i) + 2(-2 - 11i) - i$

$21i - 6i^2 - 4 - 22i - i$ $2 - 2i$

F. $8(9 + 3i) - 2(8 + 5i)$

$72 + 24i - 16 - 10i$ $56 + 14i$

G. $(2 - 4i)(-2 - 7i)$

$-4 - 14i + 8i + 28i^2$

$-32 - 6i$

H. i^{65}

$(i^2)^{32} i$

i

I. $\dfrac{-1+5i}{i} \cdot \dfrac{i}{i}$ $\dfrac{-i+5i^2}{i^2}$ $\dfrac{-5-i}{-1}$ $5 + i$

J. $\dfrac{-10+5i}{-1-2i} \cdot \dfrac{-1+2i}{-1+2i}$ $\dfrac{10-20i-5i+10i^2}{1-4i^2}$ $\dfrac{-25i}{5} \rightarrow -$

K. $\dfrac{-1-8i}{1-2i} \cdot \dfrac{1+2i}{1+2i}$ $\dfrac{-1-2i-8i-16i^2}{1-4i^2}$ $\dfrac{15-10i}{5}$

$3 - 2i$

L. Solve: $(x - 3)^2 = -16$

$x = 3 \pm 4i$