

Introduction to Complex Numbers Homework

Directions: Be sure to show all work, communicate your thought process, and justify your reasoning. Remember to check that your answers are complete, correct, and reasonable. Do not forget to complete the "Throwback" problems! ☺

✎ **SIMPLIFY EACH EXPRESSION.**

1. $\sqrt{-100} - 4$
2. $\sqrt{-72}$
3. $-\sqrt{-108} + 1$
4. $2\sqrt{-52}$
5. $5 - 3\sqrt{-147}$
6. i^{70}
7. i^{83}
8. i^{24}
9. i^{35}
10. i^{238}

✎ **WRITE EACH EXPRESSION IN STANDARD FORM. IDENTIFY THE REAL & IMAGINARY COMPONENTS.**

11. $9i - 8 - (2i - 10)$
12. $20 - (5i + 8)$
13. $\sqrt{-144} - 2i + (-1 - i)$
14. $2i^2 + 8 - \sqrt{-289} - 7i$
15. $16i + 33 - (\sqrt{-256} + 3) - i^2$

📦 **THROWBACK!**

1. Choose a value of n that makes the equation true.

$$x^2 + 14x + 24 = n + (x + 7)^2 - 36$$

2. **Line Z is perpendicular to the line given by the equation $3y - 9x = -108$ and passes through the points $(2,0)$ and $(x, x+2)$.**

a. Determine the value of x .

b. Line A is parallel to line Z and passes through the point $(9,-7)$.

Which is the equation for line A?

i. $y = 3x + 34$

ii. $y = 3x - 20$

iii. $y = -\frac{1}{3}x + 10$

iv. $y = -\frac{1}{3}x - 4$

3. **A function $g(x)$ is defined as $g(x) = x^2 - 2x$.**

a. Write a function that defines $-g(x + 2) - 8$.

b. Describe the transformation that maps the graph of $-g(x + 2) - 8$.

Solutions

Intro to Complex Numbers HW

1) $-4 + 10i$

2) $6i\sqrt{2}$

3) $1 - 6i\sqrt{3}$

4) $4i\sqrt{13}$

5) $5 - 21i\sqrt{3}$

6) $(i^2)^{35} = (-1)^{35} = \textcircled{-1}$

7) $(i^2)^{41}i$

8) $(i^2)^{24}$

9) $(i^2)^{17}i$

$= (-1)^{41}i = \textcircled{-i}$

$= (-1)^{24} = \textcircled{1}$

$(-1)^{17}i = \textcircled{-i}$

10) $(i^2)^{119} = (-1)^{119} = \textcircled{-1}$

11) $2 + 7i$ Real: 2 Imag: $7i$

12) $12 - 5i$ Real: 12 Imag: $-5i$

13) $12i - 2i - 1 - i$ Real: -1 Imag: $9i$
 $-1 + 9i$

14) $-2 + 8 - 17i - 7i$ Real: 6 Imag: $-24i$
 $6 - 24i$

15) $16i + 33 - (16i + 3) + 1$ Real: 31 Imag: $0i$
 $16i + 33 - 16i - 3 + 1$

$$13) 12i - 2i - 1 - i \quad \text{Real: } -1 \quad \text{Imag: } 9i \\ -1 + 9i$$

$$14) -2 + 8 - 17i - 7i \quad \text{Real: } 6 \quad \text{Imag: } -24i \\ 6 - 24i$$

$$15) 16i + 33 - (16i + 3) + 1 \quad \text{Real: } 31 \quad \text{Imag: } 0i \\ 16i + 33 - 16i - 3 + 1 \\ 31$$

Throwback

1. $n = 11$

2. a. $x = -1$

b. iv

3. a. $-(x+2)^2 - 2(x+2) - 8$
 $= -(x^2 + 4x + 4 - 2x - 4) - 8$
 $= -x^2 - 2x - 8$

b. reflects over x -axis
 translates left 2 units and down 8 units