

Math 119 – Chapter 12.2 (Basic Operations with Complex Numbers)

We must be able to perform the four operations of addition, subtraction, multiplication and division with complex numbers. That will be our focus in this section

The objective for this section includes

- Add, subtract, multiply and divide complex numbers

Perform the indicated operations and express all answers in the rectangular form $a + bj$. For multiplication and division problems use your calculator to verify.

1. $(5 + 7j) + (3 - 4j)$

2. $(-2 + \sqrt{-16}) + (-8 + \sqrt{-36})$

3. $(-9 - 6j) - (3 - 2j)$

4. $(7 - \sqrt{-25}) - (-3 - \sqrt{-81})$

5. $(7 - 11j) + (5 - j) - 12j$

6. $(6 - 7j) - \sqrt{-49} - (-6 - 3j)$

7. $-j(-4j)(9j)$

8. $\sqrt{-9}(3-\sqrt{-4})$

9. $(2+3j)(3-5j)$

10. $(7-\sqrt{-16})(-2-9j)$

11. $(4+5j)(4-5j)$ Notice these are conjugates!

12. $(-3 - j)(-3 + j)$ Notice these are conjugates!

13. $(-2 + 3j)^2$

14. $(-6 + 2j) - (2 - j)^2$

15. $(2j^2 - 3j^3 + 2j^4 - 2j^5)^2$

16. $\frac{5j}{3 - 7j}$

17. $\frac{5-7j}{-2j}$

18. $\frac{-7j}{-1+4j}$

19. $\frac{6-4j}{9-3j}$

20. $(5 + \sqrt{-81}) \div (-2 + \sqrt{-64})$

21. In an alternating-current circuit, the impedance Z , the current I , and the voltage V are related by: $V = ZI$

Find the impedance (in ohms) if $V = 26 + 3j$ volts and $I = 6 - 2j$ amperes.