

4-8 Complex Numbers Continued...

Graphs, Equations, & Quotients

Pull for Teacher's Notes

A. Match Complex Numbers to Points

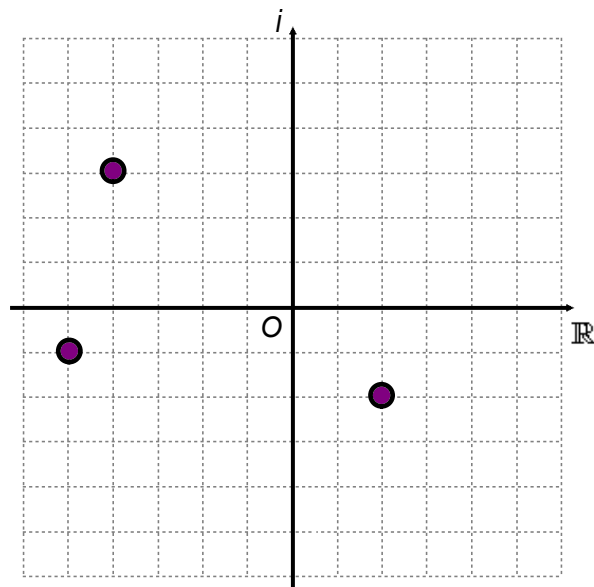
Drag

$$z = 2 - 2i$$

$$w = -4 + 3i$$

$$v = -5 - i$$

to their
matching points.



Pull for Answer

B. Absolute Value of Complex Numbers $|a + bi|$

Graph each number.

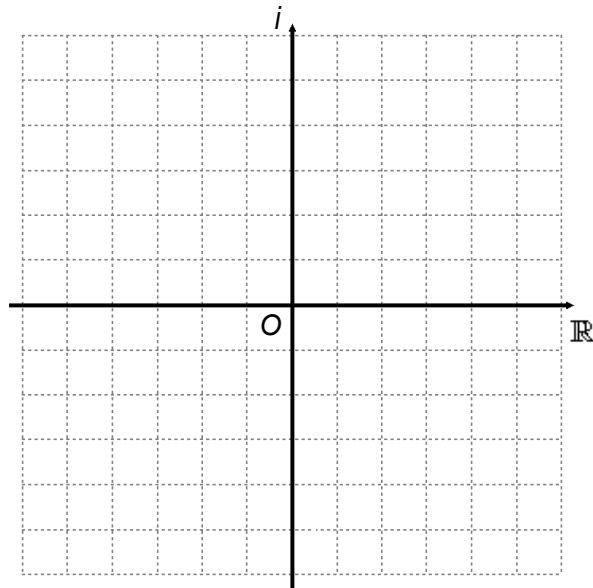
Find its absolute value.

Indicate the meaning of the absolute value on your graph.

$$z = 2 + 4i$$

$$w = -5 + 2i$$

$$v = -4 - 3i$$



Pull for Hint

Pull for Answer

C. Equations with Complex Solutions

Solve.

$$\#1 \quad -5x^2 + 3 = 0$$



C. Equations with Complex Solutions

Solve.

$$\#2 \quad 3x^2 = -27$$



C. Equations with Complex Solutions

Solve.

$$\#3 \quad 10x^2 + 6 = 0$$



C. Equations with Complex Solutions

Solve.

$$\#4 \quad 3x^2 + 2x + 5 = 0$$



D. Quotients

Divide.
$$\frac{5 + 2i}{7 + 4i}$$

The **conjugate** of $(7 + 4i)$ is $(7 - 4i)$

(Negate the imaginary part.)

Multiply the numerator and denominator by the conjugate.

$$\left(\frac{5 + 2i}{7 + 4i}\right) \left(\frac{7 - 4i}{7 - 4i}\right) =$$



Simplify each number by using the imaginary number i .

8. $\sqrt{-4}$

9. $\sqrt{-7}$

10. $\sqrt{-15}$

11. $\sqrt{-81}$

See Problem 1.

12. $\sqrt{-50}$

Plot each complex number and find its absolute value.

13. $2i$

14. $5 + 12i$

15. $2 - 2i$

16. $1 - 4i$

See Problem 2.

17. $3 - 6i$

Simplify each expression.

18. $(2 + 4i) + (4 - i)$

19. $(-3 - 5i) + (4 - 2i)$

20. $(7 + 9i) + (-5i)$

21. $(12 + 5i) - (2 - i)$

22. $(-6 - 7i) - (1 + 3i)$

23. $(8 + i)(2 + 7i)$

24. $(-6 - 5i)(1 + 3i)$

25. $(-6i)^2$

26. $(9 + 4i)^2$

See Problems 3 and 4.

Write each quotient as a complex number.

27. $\frac{3 - 2i}{5i}$

28. $\frac{-2i}{1 + i}$

29. $\frac{4 - 3i}{-1 - 4i}$

30. $\frac{i + 2}{i - 2}$

31. $\frac{4}{2 - 3i}$

32. $\frac{3 + 2i}{(1 + i)^2}$

See Problem 5.

Find the factored forms of each expression. Check your answer.

33. $x^2 + 25$

34. ~~$x^2 - 1$~~

35. $3s^2 + 75$

36. ~~$x^2 + \frac{1}{4}$~~

37. $4b^2 + 1$

38. ~~$-9x^2 - 100$~~

See Problem 6.

Find all solutions to each quadratic equation.

39. $x^2 + 2x + 3 = 0$

40. $-3x^2 + x - 3 = 0$

41. $2x^2 - 4x + 7 = 0$

42. $x^2 - 2x + 2 = 0$

43. $x^2 + 5 = 4x$

44. $2x(x - 3) = -5$

See Problem 7.

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