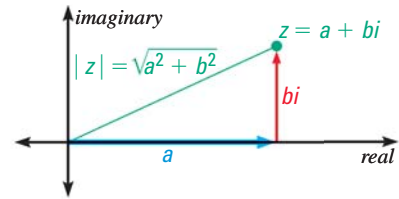


KEY CONCEPT

For Your Notebook

Absolute Value of a Complex Number

The **absolute value** of a complex number $z = a + bi$, denoted $|z|$, is a nonnegative real number defined as $|z| = \sqrt{a^2 + b^2}$. This is the distance between z and the origin in the complex plane.



EXAMPLE 7 Find absolute values of complex numbers

Find the absolute value of (a) $-4 + 3i$ and (b) $-3i$.

a. $|-4 + 3i| = \sqrt{(-4)^2 + 3^2} = \sqrt{25} = 5$

b. $|-3i| = |0 + (-3i)| = \sqrt{0^2 + (-3)^2} = \sqrt{9} = 3$

 at classzone.com



GUIDED PRACTICE for Examples 6 and 7

Plot the complex numbers in the same complex plane. Then find the absolute value of each complex number.

15. $4 - i$

16. $-3 - 4i$

17. $2 + 5i$

18. $-4i$

4.6 EXERCISES

HOMEWORK KEY

 = **WORKED-OUT SOLUTIONS**
on p. WS1 for Exs. 11, 29, and 67

 = **TAKS PRACTICE AND REASONING**
Exs. 21, 50, 60, 69, 74, 77, and 78

SKILL PRACTICE

1. **VOCABULARY** What is the complex conjugate of $a - bi$?
2. **WRITING** Is every complex number an imaginary number? *Explain.*

EXAMPLE 1

on p. 275
for Exs. 3–11

SOLVING QUADRATIC EQUATIONS Solve the equation.

3. $x^2 = -28$

4. $r^2 = -624$

5. $z^2 + 8 = 4$

6. $s^2 - 22 = -112$

7. $2x^2 + 31 = 9$

8. $9 - 4y^2 = 57$

9. $6t^2 + 5 = 2t^2 + 1$

10. $3p^2 + 7 = -9p^2 + 4$

11. $-5(n - 3)^2 = 10$

EXAMPLE 2

on p. 276
for Exs. 12–21

ADDING AND SUBTRACTING Write the expression as a complex number in standard form.

12. $(6 - 3i) + (5 + 4i)$

13. $(9 + 8i) + (8 - 9i)$

14. $(-2 - 6i) - (4 - 6i)$

15. $(-1 + i) - (7 - 5i)$

16. $(8 + 20i) - (-8 + 12i)$

17. $(8 - 5i) - (-11 + 4i)$

18. $(10 - 2i) + (-11 - 7i)$

19. $(14 + 3i) + (7 + 6i)$

20. $(-1 + 4i) + (-9 - 2i)$