

**Practice**

Form G

## Complex Numbers

Simplify each number by using the imaginary number  $i$ .

1.  $\sqrt{-49}$   $7i$

2.  $\sqrt{-144}$   $12i$

3.  $\sqrt{-7}$   $i\sqrt{7}$

4.  $\sqrt{-10}$   $i\sqrt{10}$

5.  $\sqrt{-8}$   $2i\sqrt{2}$

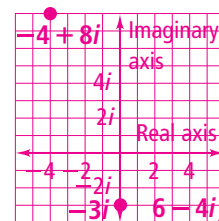
6.  $\sqrt{-48}$   $4i\sqrt{3}$

Plot each complex number and find its absolute value.

7.  $-3i$   $3$

8.  $6 - 4i$   $2\sqrt{13}$

9.  $-4 + 8i$   $4\sqrt{5}$



Simplify each expression.

10.  $(-2 + 3i) + (5 - 2i)$   $3 + i$

11.  $(-6 + 7i) + (6 - 7i)$   $0$

12.  $(4 - 2i) - (-1 + 3i)$   $5 - 5i$

13.  $(-5 + 3i) - (-8 + 2i)$   $3 + i$

14.  $(4 - 3i)(-5 + 4i)$   $-8 + 31i$

15.  $(2 - i)(-3 + 6i)$   $15i$

16.  $(5 - 3i)(5 + 3i)$   $34$

17.  $(-1 + 3i)^2$   $-8 - 6i$

18.  $(4 - i)^2$   $15 - 8i$

19.  $(-2i)(5i)(-i)$   $-10i$

20.  $(6 - \sqrt{-16}) + (-4 + \sqrt{-25})$   $2 + i$

21.  $(-2 + \sqrt{-9}) + (-1 - \sqrt{-36})$   $-3 - 3i$

22.  $(-5 + \sqrt{-4}) - (3 - \sqrt{-16})$   $-8 + 6i$

23.  $(7 - \sqrt{-1}) - \sqrt{-81}$   $7 - 10i$

24.  $3i(2 + 2i)$   $-6 + 6i$

25.  $2(3 - 7i) - i(-4 + 5i)$   $11 - 10i$

26.  $(2 + \sqrt{-4})(-1 + \sqrt{-9})$   $-8 + 4i$

27.  $(5 + \sqrt{-1})(2 - \sqrt{-36})$   $16 - 28i$

# Practice (continued)

Form G

## Complex Numbers

Write each quotient as a complex number.

28.  $\frac{5 + 2i}{4i} \quad \frac{1}{2} - \frac{5}{4}i$

29.  $\frac{3i}{-2 + i} \quad \frac{3}{5} - \frac{6}{5}i$

30.  $\frac{3 - 2i}{4 - 3i} \quad \frac{18}{25} + \frac{1}{25}i$

31.  $\frac{7}{5 - 2i} \quad \frac{35}{29} + \frac{14}{29}i$

Solve each equation. Check your answer.

32.  $x^2 + 36 \quad (x + 6i)(x - 6i)$

33.  $2x^2 + 8 \quad 2(x + 2i)(x - 2i)$

34.  $5x^2 + 5 \quad 5(x + i)(x - i)$

35.  $x^2 + \frac{1}{9} \quad (x + \frac{1}{3}i)(x - \frac{1}{3}i)$

36.  $16x^2 + 25 \quad (4x + 5i)(4x - 5i)$

37.  $-4x^2 = 49 \quad -(2x + 7i)(2x - 7i)$

Find all solutions to each quadratic equation.

38.  $x^2 + 2x + 5 = 0 \quad -1 \pm 2i$

39.  $-x^2 + 2x - 10 = 0 \quad 1 \pm 3i$

40.  $2x^2 - 3x + 5 = 0 \quad \frac{3}{4} \pm \frac{\sqrt{31}}{4}i$

41.  $-4x^2 + 6x - 3 = 0 \quad \frac{3}{4} \pm \frac{\sqrt{3}}{4}i$

42.  $3x^2 + 2x + 5 = 0 \quad -\frac{1}{3} \pm \frac{\sqrt{14}}{3}i$

43.  $2x^2 - 2x + 7 = 0 \quad \frac{1}{2} \pm \frac{\sqrt{13}}{2}i$

44. a. Name the complex number represented by each point on the graph at the right. **A:  $2 + 3i$ ; B:  $-4 + 2i$ ; C:  $-3 - 3i$ ; D:  $-4i$**

b. Find the additive inverse of each number. **A:  $-2 - 3i$ ;**

c. Find the complex conjugate of each number. **B:  $4 - 2i$ ; C:  $3 + 3i$ ;**

d. Find the absolute value of each number. **D:  $4i$**   
**A:  $\sqrt{13}$ ; B:  $2\sqrt{5}$ ; C:  $3\sqrt{2}$ ; D:  $4$**   
**A:  $2 - 3i$ ;**  
**B:  $-4 - 2i$ ;**  
**C:  $-3 + 3i$ ; D:  $4i$**

