

Name _____

6-9B Lesson Master

Questions on SPUR Objectives

See Student Edition pages 446–449 for objectives.

VOCABULARY

1. Give a complete definition for *complex number*. Be sure to identify the real part and the imaginary part.

In 2–6, give the real part and the imaginary part of each complex number.

	Real Part	Imaginary Part
2. $7 + 3i$	_____	_____
3. $-4 + i$	_____	_____
4. $6i$	_____	_____
5. $\sqrt{15} - 2i$	_____	_____
6. 24	_____	_____

In 7–11, give the complex conjugate of the number.

7. $a + bi$ _____
8. $2 + 9i$ _____
9. $-6 - i$ _____
10. $\sqrt{5} - i$ _____
11. $2 + i\sqrt{2}$ _____

In 12–15, rewrite the expression in $a + bi$ form.

12. $-7i$ _____
13. 18π _____
14. $\sqrt{-16}$ _____
15. $-\sqrt{3}$ _____

SKILLS Objective E

In 16–25, perform the operations and write the answer in $a + bi$ form.

16. $(12 + 3i) - (2 + 6i)$ _____
17. $(7 + i)(3 - 4i)$ _____

Name _____

6-9B

page 2

18. $(8 - i)(8 + i)$

19. $(4 - 3i) + (10 + 2i)$

20. $5(6 - 4i)$

21. $7i(1 + 5i)$

22. $(4 - i)^2$

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

24. $(\sqrt{3} + i)^2$

25. $(\sqrt{3} + i\sqrt{3})^2$

In 26–31, suppose $m = 1 + 8i$ and $n = -2 + 3i$. Evaluate and write the answer in $a + bi$ form.

26. mn

27. n^2

28. $4m + 3$

29. $4m + 3n$

30. $im - in$

31. $m^2 + 2m + 1$

In 32–35, suppose $Z_1 = 4 + i$ and $Z_2 = -3 - 2i$. Evaluate and write the answer in $a + bi$ form.

32. $2Z_1 - iZ_2$

33. Z_1Z_2

34. iZ_2

35. $(iZ_1)^2 - (iZ_2)^2$

36. Evaluate $\frac{-b + \sqrt{b^2 - 4ac}}{2a}$ and $\frac{-b - \sqrt{b^2 - 4ac}}{2a}$ when $a = 2$, $b = 2$, and $c = 5$.

a. $\frac{-b + \sqrt{b^2 - 4ac}}{2a} =$ _____

b. $\frac{-b - \sqrt{b^2 - 4ac}}{2a} =$ _____

37. Recall that in electrical engineering, the total impedance Z_T of a circuit made from two circuits connected in parallel is $Z_T = \frac{Z_1Z_2}{Z_1 + Z_2}$ where Z_1 and Z_2 are the impedances of the individual circuits. Find the total impedance of a circuit with $Z_1 = -1 + 2i$ ohms and $Z_2 = 4 - i$ ohms.
