pg. 274 #4-44 x4 46 58-66e

4. $\sqrt{-81}$ (positive is implied since it's not $-\sqrt{-81}$)

$= 9i$

12. real + imaginary

$8 + \sqrt{-8}$

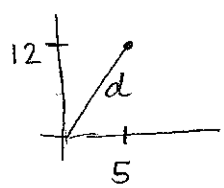
$\sqrt{-1}\,\sqrt{8}$

$i \wedge i \quad 2 \cdot 4$

$2 \cdot 2$

$8 + 2i\sqrt{2}$

20. $|5+12i|$



$d = \sqrt{5^2+12^2}$

$d = \sqrt{25+144}$

$d = \sqrt{169}$

$d = 13$

24. number + additive inverse = 0

$4i + (-4i) = 0$

$-4i$

32. $6 - (8 + 3i)$

$6 - 8 - 3i$

$-2 - 3i$

44. $x^2 = -7$

$\pm\sqrt{x^2} = \pm\sqrt{-7}$

$x = \pm i\sqrt{7}$

whenever you bring the $\sqrt{\ }$ into the equation to "undo" exponents, you MUST include both answers, $\pm$

58. $(2+\sqrt{-1}) + (-3 + \sqrt{-16})$

$2 + i + (-3) + 4i$

$\boxed{-1 + 5i}$

Answers for Lesson 5-6, pp. 274–276 Exercises

1. $2i$	**2.** $i\sqrt{7}$	**3.** $i\sqrt{15}$
4. $9i$	**5.** $5i\sqrt{2}$	**6.** $4i$
7. $4i\sqrt{2}$	**8.** $9i$	**9.** $-10i$
10. $6i\sqrt{2}$	**11.** $2 + i\sqrt{3}$	**12.** $8 + 2i\sqrt{2}$
13. $6 - 2i\sqrt{7}$	**14.** $3 + 2i$	**15.** $7 - 5i$
16. $2 + i$	**17.** $-2 - 5i\sqrt{2}$	**18.** $4 + 6i\sqrt{2}$
19. 2	**20.** 13	**21.** $2\sqrt{2}$
22. $\sqrt{17}$	**23.** $3\sqrt{5}$	**24.** $-4i$
25. $-5 + 3i$	**26.** $-9 - i$	**27.** $3 + 2i$
28. $4 - 7i$	**29.** $6 + 3i$	**30.** $1 - 7i$
31. $7 + 4i$	**32.** $-2 - 3i$	**33.** $10 + 6i$
34. $-7 - 10i$	**35.** 10	**36.** $26 - 7i$
37. $9 + 58i$	**38.** $9 - 23i$	**39.** -36
40. $65 + 72i$	**41.** $\pm 5i$	**42.** $\pm\frac{i\sqrt{2}}{2}$
43. $\pm\frac{8i\sqrt{3}}{3}$	**44.** $\pm i\sqrt{7}$	**45.** $\pm 6i$

46. $\pm\frac{i\sqrt{15}}{5}$

47. $-i, -1 - i, i$

48. $-2i, -4 - 2i, 12 + 14i$

49. $1 - i, 1 - 3i, -7 - 7i$

50. $\pm i\sqrt{65}$ **51.** $\pm 7i$ **52.** $\pm i$

53. No; the test scores were real numbers. He added the scores and divided by the number of scores. The set of real numbers is closed with respect to addition and division so he should have gotten a real number.

54. **a.** A: -5, B: $3 + 2i$, C: $2 - i$, D: $3i$, E: $-6 - 4i$, F: $-1 + 5i$

b. $5, -3 - 2i, -2 + i, -3i, 6 + 4i, 1 - 5i$

55. **a.** Check students' work.

b. a circle with radius 10 and center at the origin

56. $-5, 5$ **57.** $288i$ **58.** $-1 + 5i$

59. $10 - 4i$ **60.** $8 - 2i$ **61.** $11 - 5i$

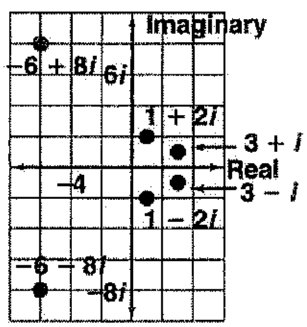
62. $6 + 10i$ **63.** $7 - i$ **64.** $10 + 11i$

65. $-27 + 8i$ **66.** $-13 + i$

67. **a.** row 2: $2, 5, \sqrt{5}, \sqrt{5}$
row 3: $6, 10, \sqrt{10}, \sqrt{10}$
row 4: $-12, 100, 10, 10$

b. Answers may vary. Sample: The sum of a complex number $a + bi$ and its conjugate is $2a$. The product of $a + bi$ and its conjugate is the square of the absolute value of $a + bi$. The absolute values of a complex number and its conjugate are equal.

c.



They are symmetric images of each other with respect to the real axis.

d. True; the additive inverse of $a + bi$ is $-a - bi$, and the conjugate of $-a - bi$ is $-a + bi$. The conjugate of $a + bi$ is $a - bi$, and the additive inverse of $a - bi$ is $-a + bi$.

68. $x = -7, y = 3$ **69.** $x = \frac{16}{3}, y = -\frac{19}{8}$ **70.** $x = -7, y = -3$

71. $(a + bi)(a - bi) = a^2 + b^2$; since a and b are real, so is $a^2 + b^2$.