ANSWERS FOR 5.4

5.4 Guided Practice

2. *Sample answer:* The real part should be the same and the imaginary part should be the opposite of the given imaginary part; $-5 - 2i$.

4. $\pm 3i$ **6.** $1 \pm i\sqrt{7}$

8. $6 - i$

10. $\dfrac{-1 - 7i}{2}$

12. 3 **14.** $5\sqrt{2}$

16. *Sample answer:* It does not because the absolute values become infinitely larger.
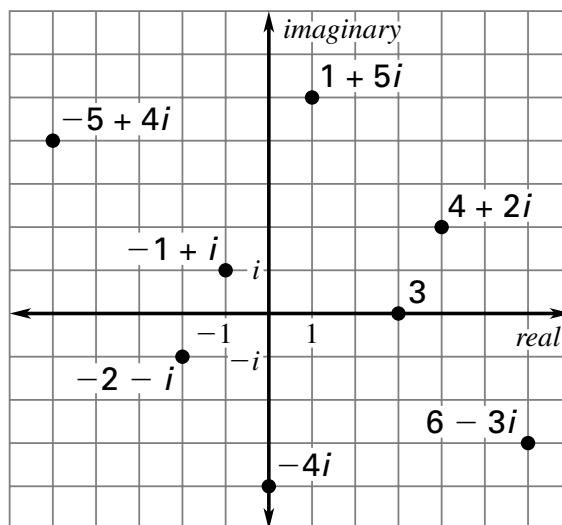
5.4 Practice and Applications

18. $\pm i\sqrt{11}$ **20.** $\pm 5i$

22. $\pm 3i\sqrt{2}$ **24.** $\pm \dfrac{1}{2}i$

26. $-5 \pm 2i\sqrt{5}$

28. $4 \pm \dfrac{1}{3}i$

30.–36.

38. $11 + i$ **40.** $8 - 4i$

42. $12 - 10i$ **44.** $21i$

46. $12 + 23i$ **48.** $4 + 24i$

50. $39 + 13i$ **52.** $-36 - 93i$

54. $-91 + 60i$

56. $4 - 4i$

58. $-\dfrac{3}{4} + \dfrac{5}{4}i$

60. $\dfrac{20 + 21i}{29}$

62. $\dfrac{10}{11} + \dfrac{\sqrt{10}}{11}i$

64. 5 **66.** $\sqrt{5}$

68. $\sqrt{29}$ **70.** $3\sqrt{13}$

72. *Sample answer:* No, because the absolute values become infinitely large.
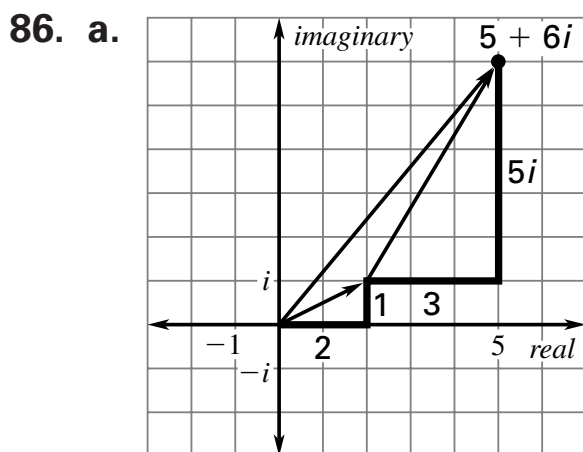
74. *Sample answer:* It does because the absolute values are less than $N = 2$.

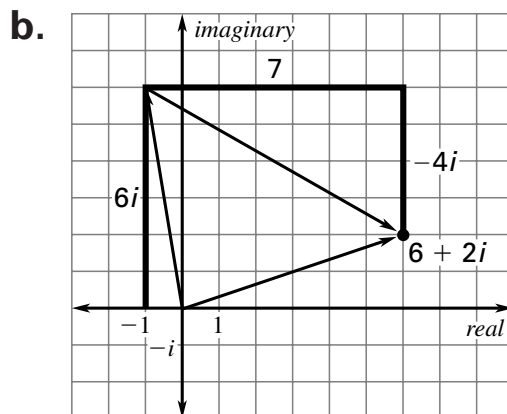**76.** *Sample answer:* It does not because the absolute values become infinitely large.

78. *Sample answer:* It does because the absolute values are less than $N = 1$.

80. false   **82.** true

84. false; *Sample answer:* Let the real number $4 = 5 + i^2$; its complex conjugate is $5 - i^2$ which is equal to 6; $4 \neq 6$.

86. a.

$5 + 6i$

b.

$6 + 2i$

88. true; false   **90.** true; true

92. no

94. a. $-1 - i$; $\dfrac{1 - i}{2}$

b. $-3 + i$; $\dfrac{3}{10} + \dfrac{1}{10}i$

c. $2 - 8i$; $-\dfrac{1}{34} - \dfrac{2}{17}i$

96. a. $\dfrac{54}{17} + \dfrac{22}{17}i$

b. $\dfrac{997}{205} + \dfrac{129}{205}i$
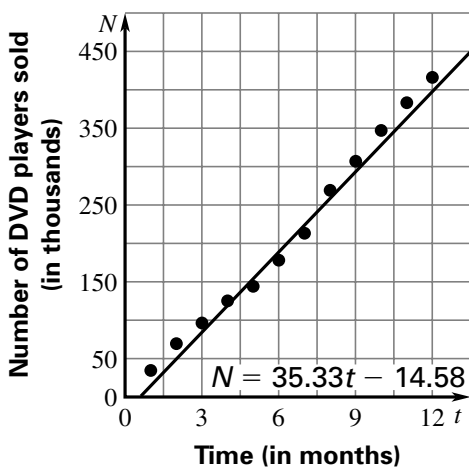
c. $\dfrac{124}{29} + \dfrac{78}{29}i$

98. C

100. a. $1;\ i;\ -1;\ -i;\ 1$

    b. *Sample answer:* The pattern is $i,\ -1,\ -i,\ 1;$ $i^9 = i,\ i^{10} = -1,$ $i^{11} = -i,\ i^{12} = 1$

    c. $-1;\ -i$

5.4 Mixed Review

102. 44 **104.** 2

106. $(-5, 7)$ **108.** $-3,\ -5$

110. $6,\ 16$

112. $-7 \pm 2\sqrt{3}$

114.

$y = 35.33x - 14.58$