LESSON 1.1

Exercise Set A

MM2N1a Write square roots of negative numbers in imaginary form.

MM2N1b Write complex numbers in the form $a + bi$.

Simplify the expression.

1. $\sqrt{500}$ $10\sqrt{5}$
2. $\sqrt{108}$ $6\sqrt{3}$
3. $\sqrt{242}$ $11\sqrt{2}$
4. $\sqrt{128}$ $8\sqrt{2}$
5. $\sqrt{125}$ $= 5\sqrt{5}$
6. $\sqrt{343}$ $7\sqrt{7}$
7. $\sqrt{\frac{25}{169}} = \frac{5}{13}$
8. $\sqrt{\frac{16}{36}} = \frac{4}{6}$
9. $\sqrt{\frac{23}{121}} = \frac{\sqrt{23}}{11}$
10. $\sqrt{\frac{6}{9}} = \frac{\sqrt{6}}{3}$
11. $\sqrt{\frac{27}{4}} = \frac{3\sqrt{3}}{2}$
12. $\sqrt{\frac{32}{25}} = \frac{4\sqrt{2}}{5}$

Match the complex number with the correct standard form.

13. $10 + \sqrt{-16}$ $= 10 + 4i$
14. $\sqrt{-16}$ $= 4i$
15. $10 - \sqrt{-16}$ $= 10 - 4i$

A. $4i$

B. $10 + 4i$

C. $10 - 4i$

Write the complex number in standard form.

16. $\sqrt{-4}$ $= 2i$
17. $\sqrt{-64}$ $= 8i$
18. $\sqrt{-100}$ $= 10i$
19. $\sqrt{-32}$ $= 4i\sqrt{2}$
20. $\sqrt{-17}$ $= i\sqrt{17}$
21. $\sqrt{-75}$ $= 5i\sqrt{3}$
22. $\sqrt{-45}$ $= 3i\sqrt{5}$
23. $\sqrt{-\frac{108}{49}} = \frac{6i\sqrt{3}}{7}$
24. $\sqrt{-\frac{68}{81}} = \frac{2i\sqrt{17}}{9}$
25. $3 + \sqrt{-2}$ $= 3 + i\sqrt{2}$
26. $5 - \sqrt{-21}$ $= 5 - i\sqrt{21}$
27. $9 + \sqrt{-81}$ $9 + 9i$
28. $-2 + \sqrt{-18}$ $= -2 + 3i\sqrt{2}$
29. $-4 - \sqrt{49}$ $= -4 - 7 = -11$
30. $8 - \sqrt{-48}$ $8 - 4i\sqrt{3}$
31. $\sqrt{-11} + 6$ $= 6 + i\sqrt{11}$
32. $-\sqrt{-25} + 12$ $= -5i + 12$ $= 12 - 5i$
33. $\sqrt{144} - 11$ $= 12 - 11 = 1$

Error Analysis ***Describe*** **and correct the error in writing the complex number in standard form.**

34. $5 - 3i$

$$\begin{aligned} 5 - \sqrt{-9} &= 5 - (\sqrt{-9}) \\ &= 5 - (-3) \\ &= 5 + 3 \\ &= 8 \end{aligned}$$

X

35. $3 + 2i\sqrt{2}$

$$\begin{aligned} 3 + \sqrt{-8} &= 3 + \sqrt{8(-1)} \\ &= 3 + \sqrt{8}\sqrt{-1} \\ &= 3 + 2i\sqrt{2} \\ &= 5i\sqrt{2} \end{aligned}$$

X

Find real numbers x and y to make the equation true.

36. $2x - 4yi = 8 + 12i$ $x = 4$, $y = -3$
37. $5x + yi = 10 + i$ $x = 2$, $y = 1$
38. $-3x + 2yi = 15 - 4i$ $x = 5$, $y = -2$
39. $-2x + 6yi = 14 - 24i$
40. $4x + 3i = 16 - yi$ $x = 4$, $y = +3$
41. $11 - 5yi = x + 10i$ $x = 11$, $y = -2$
42. $x + 7yi = -6 + 21i$ $x = -6$, $y = 3$
43. $-4x - 4yi = 4 + 48i$ $x = -1$, $y = -12$
44. $22 - 8i = 11x + 4yi$ $x = 2$, $y = -2$
45. The complex numbers $-2xi + 8$ and $6 + 4yi$ are equal. Find the values of x and y.