7-5 **Reteaching** (continued)

Rational Exponents and Radicals

You can use the properties of exponents to simplify expressions with rational
exponents. When simplifying radical expressions, you can combine like terms.

Problem

What is the simplified form of the expression, $\left(a^{\frac{1}{4}}\right)\left(a^{\frac{1}{4}}\right)$? Use the properties of

exponents, and then write the expression in radical form.

$$\left(a^{\frac{1}{4}}\right)\left(a^{\frac{1}{4}}\right) = a^{\frac{1}{4}+\frac{1}{4}} = a^{\frac{1}{2}}$$ When multiplying like bases, add the exponents.

$$= \sqrt{a}$$ Rewrite in radical form.

Simplify each expression using the properties of exponents, and then write the
expression in radical form.

9. $\left(a^{\frac{2}{3}}\right)\left(a^{\frac{1}{4}}\right)$

10. $(ab)^{\frac{1}{3}}\left(b^{\frac{1}{2}}\right)$

11. $\left(5x^{\frac{1}{5}}\right)(x^2)$

12. $(8x)^{\frac{1}{3}}(64x)^{\frac{1}{2}}$

Problem

What is the exponential form of the expression, $\sqrt{a^3} + 3\sqrt{a^5}$?

$$\sqrt{a^3} + 3\sqrt{a^5} = a^{\frac{3}{2}} + 3a^{\frac{5}{2}}$$ Rewrite the expression in exponential form. The expression
cannot be simplified further because the terms are not
like terms.

Write each expression in exponential form. Simplify when possible.

13. $\sqrt[3]{a^2} + 2\sqrt[3]{a^2}$

14. $\left(\sqrt{16x^4}\right) + \left(\sqrt[6]{27x^5}\right)$

15. $\sqrt[3]{(27x)^2} + \sqrt[4]{256x^2}$

16. $4\sqrt[3]{(3x)^6} - \sqrt{(2x)^4}$