Rewrite and simplify each expression using properties of exponents.
Make sure your answer has no exponents that are negative or zero.

A. $a^{\frac{2}{3}} \div a^{\frac{1}{2}}$

$= a^{\frac{2}{3}-\frac{1}{2}}$

$= a^{\frac{4}{6}-\frac{3}{6}}$

$= a^{\frac{1}{6}}$ or $\sqrt[6]{a}$

B. $\left[\left(2b^{\frac{3}{4}}\right)\left(4b^{\frac{3}{2}}\right)\right]^{\frac{2}{3}}$

$= \left[8\, b^{\frac{3}{4}+\frac{3}{2}}\right]^{2/3}$

$= \left[8\, b^{\frac{3}{4}+\frac{6}{4}}\right]^{2/3}$

$= \left[8\, b^{9/4}\right]^{2/3}$

$= 8^{2/3}\, b^{9/4 \cdot 2/3}$

$= \left(\sqrt[3]{8}\right)^2 b^{\frac{3}{2}}$

$= (2)^2 b^{3/2} = 4\sqrt{b^3}$

Answer Example 2 "try It!" in the Student Companion on page 118.

a. $\sqrt[4]{81a^8b^5}$

$= 3a^2|b|\sqrt[4]{b}$

b. $\sqrt[3]{\frac{x^4y^2}{125x}}$

$= \sqrt[3]{\frac{x^3y^2}{125}}$

$= \frac{x\sqrt[3]{y^2}}{5}$

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Reduced Radical Form:

When no factors under a radical with index n are either perfect n^{th} roots or have factors that are perfect n^{th} roots, and there are no radicals in denominators.

Product and Quotient Properties of Radicals.

Product Property of Radicals:

$\sqrt[n]{ab} = \sqrt[n]{a} \cdot \sqrt[n]{b}$

Quotient Property of Radicals:

$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}} \qquad \left(\frac{a}{b}\right)^{\frac{1}{n}} = \frac{a^{\frac{1}{n}}}{b^{\frac{1}{n}}}$

You applied this property when you answered part a) from Example 2 "try It!" p118

$\sqrt[4]{81\, a^8 b^5}$

$= \sqrt[4]{81} \cdot \sqrt[4]{a^8} \cdot \sqrt[4]{b^5}$

$= 3a^2 b\sqrt[4]{b}$

Rewrite and simplify each expression using properties of exponents.
Make sure your answer has no exponents that are negative or zero.

1. $\sqrt{8x^5y} \cdot \sqrt{2x^6y^3}$

$= \sqrt{(8x^5y)(2x^6y^3)}$

$= \sqrt{16x^{11}y^4}$

$= \boxed{4|x^5|y^2\sqrt{x}}$

2. $\sqrt{3x^5y} \cdot \sqrt[4]{9x^6y^3}$

$(3x^5y)^{1/2 \cdot 2/2}$

$(3x^5y)^{2/4}$

$\sqrt[4]{(3x^5y)^2} \cdot \sqrt[4]{9x^6y^3}$

$= \sqrt[4]{9x^{10}y^2} \cdot \sqrt[4]{9x^6y^3}$

$= \sqrt[4]{81x^{16}y^5}$

$= \boxed{9x^4|y|\sqrt[4]{y}}$

Assume all variables are positive values.

4. $\sqrt{\dfrac{2x^7y^{13}}{36x^2y^6}}$

$= \dfrac{\sqrt{2x^7y^{13}}}{\sqrt{36x^2y^6}}$

$= \dfrac{x^3y^6\sqrt{2xy}}{6xy^3}$

$= \boxed{\dfrac{x^2y^3\sqrt{2xy}}{6}}$

5. $\dfrac{\sqrt{50a^3b^6}}{\sqrt{32a^9b^3}}$

$= \sqrt{\dfrac{50a^3b^6}{32a^9b^3}}$

$= \sqrt{\dfrac{25\ b^3}{16a^6}}$

$= \dfrac{\sqrt{25\ b^3}}{\sqrt{16a^6}}$

$= \boxed{\dfrac{5b\sqrt{b}}{4a^3}}$

Hwk #2 Sec 5-2

Page 252 Due tomorrow

Problems 5, 6, 20-22, 26, 28, 29, 31