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Simplify. $\underbrace{a \cdot a \cdot a}_{a^3} \cdot \underbrace{a \cdot a \cdot a \cdot a \cdot a}_{a^5}$

1. $a^3 b^2 (a^5 b) = a^8 b^3$ 5. $(a^3 b^0)^{-2}$

2. $(a^3 b^2)^4 = (a^3)^4 (b^2)^4$
 $a^{12} b^8$

$(a^3)^{-2} (b^0)^{-2}$
 $a^{-6} b^0 = \frac{1}{a^6}$

3. $a^0 = 1$

6. $(3x^2 y^{-4})^3$

4. $a^{-5} = \frac{1}{a^5}$

$3^3 (x^2)^3 (y^{-4})^3$

$27x^6 y^{-12}$

Sec. 3.1 Evaluate n^{th} Roots and Use Rational Exponents

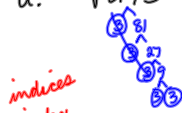
If $b^n = a$ then b is an n^{th} root of a .

Ex: 2 is a 3rd root of 8 because $2^3 = 8$.

This means $\sqrt[3]{8} = 2$.
 $\sqrt[3]{2^3} = 2$

Find:

a. $\sqrt[3]{243} = 3\sqrt[3]{3 \cdot 3} = 3\sqrt[3]{9}$



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b. $\sqrt[4]{48} = 2\sqrt[4]{3}$



c. $\sqrt[3]{500} = 5\sqrt[3]{4}$



d. $\sqrt[3]{104} = 2\sqrt[3]{13}$



e. $\sqrt[3]{12} \cdot \sqrt[3]{18} = \sqrt[3]{12 \cdot 18} = 3 \cdot 2 = \boxed{6}$



f. $\sqrt[3]{125} \cdot \sqrt[3]{8} = \sqrt[3]{1000} = 10$
 $5 \cdot 2$
 10

g. $\frac{\sqrt[5]{96}}{\sqrt[5]{3}} = \sqrt[5]{\frac{96}{3}} = \sqrt[5]{32} = 2$



h. $\frac{\sqrt[4]{10}}{\sqrt[4]{27}} \cdot \frac{\sqrt[4]{3}}{\sqrt[4]{3}} = \frac{\sqrt[4]{2 \cdot 5 \cdot 3}}{\sqrt[4]{3 \cdot 3 \cdot 3}} = \frac{\sqrt[4]{30}}{3}$

i. $\sqrt[5]{\frac{3}{4}} = \frac{\sqrt[5]{3}}{\sqrt[5]{2 \cdot 2}} \cdot \frac{\sqrt[5]{2 \cdot 2 \cdot 2}}{\sqrt[5]{2 \cdot 2 \cdot 2}} = \frac{\sqrt[5]{24}}{2}$

p. 176 (15-31) all

