

More 6.2- Radicals

Properties 3 and 6 can be applied to simplify radicals

$$3) (ab)^m = a^m b^m$$

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

ex: $\sqrt[3]{24}$

$$\sqrt[3]{8} \cdot \sqrt[3]{3}$$

$$2 \sqrt[3]{3}$$

$$6) \left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

ex: $\frac{\sqrt[5]{96}}{\sqrt[5]{3}}$

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

$$2$$

Simplify Radicals:

a radical with index n is in simplest form if the radicand has no perfect n th powers as factors and all denominators are rationalized.

$$\text{ex: } \sqrt[3]{104}$$

$$\sqrt[3]{8} \cdot \sqrt[3]{13}$$

$$2 \sqrt[3]{13}$$

$$\text{ex: } \frac{\sqrt[3]{7}}{\sqrt[3]{4} \cdot 3} \cdot \frac{\sqrt[3]{9}}{\sqrt[3]{9}} = \frac{\sqrt[3]{63}}{\sqrt[3]{27}}$$

$$\frac{\sqrt[3]{63}}{3}$$

$$\text{ex: } \frac{\sqrt[4]{10}}{\sqrt[4]{27}} \cdot \frac{\sqrt[4]{3}}{\sqrt[4]{3}} = \frac{\sqrt[4]{30}}{\sqrt[4]{81}}$$

$$\frac{\sqrt[4]{30}}{3}$$

$$\sqrt[3]{3^1} \quad \sqrt[3]{3^2}$$

To add or subtract radicals the radicand and index must be the same

$$\text{ex: } 7\sqrt[5]{12} - \sqrt[5]{12}$$

$$6\sqrt[5]{12}$$

$$\text{ex: } \sqrt[3]{81} - \sqrt[3]{24}$$

$$\sqrt[3]{27} \sqrt[3]{3} - \sqrt[3]{8} \cdot \sqrt[3]{3}$$

$$3 \sqrt[3]{3} - 2 \sqrt[3]{3}$$

$$\sqrt[3]{3}$$

Simplifying expressions with variables:

remember: $\sqrt{x^5 y^9}$

$$\sqrt{x^4 y^8} \quad \sqrt{xy}$$

$$x^2 y^4 \sqrt{xy}$$

ex: $\sqrt[4]{625z^{12}}$

$$5z^3$$

$$(625z^{12})^{1/4}$$

ex: $\sqrt[6]{\frac{r^6}{s^{18}}}$

$$\left(\frac{r^6}{s^{18}}\right)^{1/6}$$

$$\frac{r}{s^3}$$

ex: $\sqrt[3]{6x^4 y^9 z^{14}}$

$$\sqrt[3]{x^3 y^9 z^{12}} \quad \sqrt[3]{6x z^2}$$

$$xy^3 z^4 \quad \sqrt[3]{6x z^2}$$

ex: $\sqrt[7]{\frac{p^8}{q^5}} \quad \frac{\sqrt{g^2}}{\sqrt{g^2}} \quad \frac{\sqrt[7]{p^8 g^2}}{\sqrt[7]{g^7}}$

$$\frac{\sqrt[7]{p^8 g^2}}{g} \quad \frac{\sqrt[7]{p^7} \sqrt[7]{p g^2}}{\sqrt[7]{p} \sqrt[7]{p g^2}}$$

$$\frac{p \sqrt[7]{p g^2}}{g}$$

A#4 WS 6.1 – 6.2 Practice #9 – 16, 18 – 22

A#5 pg 424 #3, 5, 8, 15, 19, 24, 26, 27, 32,
33, 38, 43, 44, 47, 53 – 55, 57, 58, 60, 61

PROPERTIES OF RATIONAL EXPONENTS Simplify the expression.

3. $5^{3/2} \cdot 5^{1/2}$

4. $(6^{2/3})^{1/2}$

5. $3^{1/4} \cdot 27^{1/4}$

8. $\left(\frac{7^3}{4^3}\right)^{-1/3}$

PROPERTIES OF RADICALS Simplify the expression.

15. $\sqrt{20} \cdot \sqrt{5}$

19. $\frac{\sqrt[5]{64}}{\sqrt[3]{2}}$

SIMPLEST FORM Write the expression in simplest form.

24. $\sqrt{72}$

26. $\sqrt[3]{108} \cdot \sqrt[3]{4}$

27. $5\sqrt[4]{64} \cdot 2\sqrt[4]{8}$

COMBINING RADICALS AND ROOTS Simplify the expression.

32. $2\sqrt[6]{3} + 7\sqrt[6]{3}$

33. $\frac{3}{5}\sqrt[3]{5} - \frac{1}{5}\sqrt[3]{5}$

38. $12\sqrt[4]{2} - 7\sqrt[4]{512}$

VARIABLE EXPRESSIONS Simplify the expression. Assume all variables are positive.

43. $x^{1/4} \cdot x^{1/3}$

44. $(y^4)^{1/6}$

47. $\frac{x^{2/5}y}{-1/3}$

SIMPLEST FORM Write the expression in simplest form. Assume all variables are positive.

53. $\sqrt[4]{12x^2y^6z^{12}}$

54. $\sqrt[3]{4x^3y^5} \cdot \sqrt[3]{12y^2}$

55. $\sqrt{x^2yz^3} \cdot \sqrt{x^3z^5}$

57. $\sqrt[3]{\frac{x^3}{y^4}}$

58. $\sqrt{\frac{20x^3y^2}{9xz^3}}$