

Homework Questions

7.2 #24, 53, 57

(21)

$(-16)^{\frac{3}{4}}$ ← 4 is even
 ↑
 inside "radical"
 Not Real

$-16^{\frac{3}{4}} = -8$

(24)

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

$(2x)^{\frac{3}{5}} = \sqrt[5]{8x^3}$

(53)

$\frac{(x^3)^{\frac{1}{2}}}{x^{\frac{7}{2}}} = \frac{x^{\frac{3}{2}}}{x^{\frac{7}{2}}}$

(3)($\frac{1}{2}$) = $\frac{3}{1} \cdot \frac{1}{2} = \frac{3 \cdot 1}{1 \cdot 2} = \frac{3}{2}$

= $x^{\frac{3}{2} - \frac{7}{2}} = x^{-\frac{4}{2}} = x^{-2} = \frac{1}{x^2}$

$\frac{1}{x^{\frac{7}{2} - \frac{3}{2}}} = \frac{1}{x^{\frac{4}{2}}} = \frac{1}{x^2}$

(57)

$\frac{(y^3 z)^{\frac{1}{6}}}{y^{-\frac{1}{2}} z^{\frac{1}{3}}} = \frac{y^{\frac{1}{2}} z^{\frac{1}{6}}}{y^{-\frac{1}{2}} z^{\frac{1}{3}}}$

(3)($\frac{1}{6}$) = $\frac{3}{6} = \frac{1}{2}$

= $y^{\frac{1}{2} - (-\frac{1}{2})} z^{\frac{1}{6} - \frac{1}{3}}$

$\frac{1}{2} + \frac{1}{2} = 1$

$\frac{1}{6} - \frac{1}{3} =$

= $y z^{-\frac{1}{6}} = \boxed{\frac{y}{z^{\frac{1}{6}}}}$

$\frac{1}{3 \cdot 2} - \frac{1}{3} \cdot \frac{2}{2}$

= $\frac{1-2}{3 \cdot 2} = -\frac{1}{6}$

Use Rational Exponents to simplify

$$\sqrt[n]{x^m} = x^{\frac{m}{n}}$$

S 7.2 Finish.
Write final answer in radical form.

$$\sqrt[10]{y^5} = y^{\frac{5}{10}} = y^{\frac{1}{2}} = \sqrt{y} = \sqrt{y}$$

$$\sqrt[4]{9} = 9^{\frac{1}{4}} = (3^2)^{\frac{1}{4}} = 3^{\frac{2}{4}} = \sqrt{3}$$

$$(2)\left(\frac{1}{4}\right) = \frac{2}{4} = \frac{1}{2}$$

$$\frac{2}{1} \cdot \frac{1}{4} = \frac{2 \cdot 1}{1 \cdot 4} = \frac{2}{4}$$

$$\sqrt[9]{a^6 n^3} = (a^6 n^3)^{\frac{1}{9}} = (a^6)^{\frac{1}{9}} (n^3)^{\frac{1}{9}}$$

$$= a^{(6)\left(\frac{1}{9}\right)} n^{(3)\left(\frac{1}{9}\right)} = a^{\frac{6}{9}} n^{\frac{3}{9}} = a^{\frac{2}{3}} n^{\frac{1}{3}}$$

$$= a^{2 \cdot \frac{1}{3}} n^{\frac{1}{3}} = (a^2)^{\frac{1}{3}} n^{\frac{1}{3}} = (a^2 n)^{\frac{1}{3}} = \sqrt[3]{a^2 n}$$

After much practice & ease...

$$\sqrt[9]{a^6 n^3} = a^{\frac{6}{9}} n^{\frac{3}{9}} = a^{\frac{2}{3}} n^{\frac{1}{3}} = (a^2 n)^{\frac{1}{3}} = \sqrt[3]{a^2 n}$$

$$\frac{6}{9} = \frac{3 \cdot 2}{3 \cdot 3} = \frac{2}{3}$$

$$\frac{3}{9} = \frac{3 \cdot 1}{3 \cdot 3} = \frac{1}{3}$$

write as a single radical

$$\sqrt{w} \sqrt[3]{w} = w^{\frac{1}{2}} w^{\frac{1}{3}} = w^{\frac{1}{2} + \frac{1}{3}} = w^{\frac{5}{6}} = \sqrt[6]{w^5}$$

$$\frac{\sqrt[3]{x}}{\sqrt[4]{x}} = \frac{x^{\frac{1}{3}}}{x^{\frac{1}{4}}} = x^{\frac{1}{3} - \frac{1}{4}} = x^{\frac{1}{12}} = \sqrt[12]{x}$$

$$\frac{1}{3} - \frac{1}{4} = \frac{4}{4} \cdot \frac{1}{3} - \frac{3}{3} \cdot \frac{1}{4}$$

$$\text{LCD} = 3 \cdot 4$$

$$= \frac{4-3}{12} = \frac{1}{12}$$

$$a^c b^c = (ab)^c$$

$$\boxed{\sqrt{5} \sqrt[3]{2}} = 5^{\frac{1}{2}} 2^{\frac{1}{3}}$$

$$= 5^{\frac{3}{6}} 2^{\frac{2}{6}} = (5^3)^{\frac{1}{6}} (2^2)^{\frac{1}{6}}$$

$$= \sqrt[6]{5^3 \cdot 2^2} = \boxed{\sqrt[6]{500}}$$

LCD of 2 & 3 is 6

$$\frac{1}{2} = \frac{1}{2} \cdot \frac{3}{3} = \frac{3}{6}$$

$$\frac{1}{3} = \frac{1}{3} \cdot \frac{2}{2} = \frac{2}{6}$$

Trick was to get both exponents to have same denominator.

7.3

Product Rule

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

Same index only

Quotient Rule

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

$$\frac{\sqrt[3]{6}}{\sqrt{7}} = \text{Rules don't apply}$$

$$\sqrt{2} \sqrt{7} = \sqrt{14}$$

$$(\sqrt{2})(\sqrt{7})$$

$$\sqrt{2} \cdot \sqrt{7}$$

$$\sqrt[3]{2} \sqrt[3]{32} = \sqrt[3]{64} = \sqrt[3]{2^6}$$

Primes: 2, 3, 5, 7, 11, 13, 17, 19, 23

$$= 2^{\frac{6}{3}} = 2^2 = 4$$

1	2	64
2	2	32
3	2	16
4	2	8
5	2	4
		2
		4

MAIN/BASIC SKILL:

Factor an integer into the product of primes

Every 4th, mostly.

Due Friday: 7.3 #s 1, 5, 9, 13, 17, ... , 73, 76, 81, 85, 89