

OCTOBER 31, 2012
SECTION 7.2 (NOTATIONS)

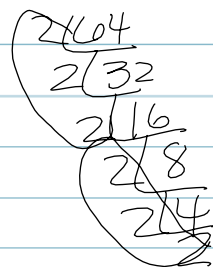
By definition $x^{m/n} = \sqrt[n]{x^m}$

ex) $x^{1/2} = \sqrt[2]{x^1} = \sqrt{x}$

ex) $8^{2/3} = \sqrt[3]{8^2} = \sqrt[3]{64} = 4$

ex) $16^{1/2} = \sqrt{16} = 4$

ex) $8^{1/3} = \sqrt[3]{8} = 2$



Shortcut

ex) $8^{2/3}$

2 2ND Power

3 cube root

$8^{2/3} = 2^2 = 4$



ex) $-27^{-4/3} = -1 \cdot 27^{-4/3}$

- move it

4 4th power

3 cube root

$-1 \cdot 27^{-4/3}$

$-1 \cdot 3^{-4}$

$-1 \cdot \frac{1}{3^4} = -\frac{1}{81}$

ex) $(-16)^{-5/4}$

- move it

5 5th power

4 4th root

ex) $-16^{-5/4}$

$\sqrt[4]{-16}$

= not real

$-1 \cdot 2^{-5}$

$-1 \cdot \frac{1}{2^5} = -\frac{1}{32}$

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7.2 cont. NOTES

EX $x^{\frac{1}{3}} \cdot x^{\frac{3}{4}}$ or $x^{\frac{1}{3} + \frac{3}{4}} = x^{\frac{4+9}{12}} = \boxed{x^{\frac{13}{12}}}$ ^{ANS}

$x^3 x^4 = x^7$

EX $3^{\frac{1}{3}} \cdot 3^{\frac{3}{4}} = 3^{\frac{1}{3} + \frac{3}{4}} = 3^{\frac{4}{12} + \frac{9}{12}} = \boxed{3^{\frac{13}{12}}}$ ^{ANS}

$3^{\frac{1}{3} + \frac{3}{4}} = 3^{\frac{1}{3} + \frac{3}{4}} = \text{LCD } \frac{4+9}{12}$

EX $\left(\frac{x^{\frac{3}{4}} y^{\frac{2}{3}}}{x^{\frac{1}{3}} y^{\frac{5}{2}}} \right)^{\frac{1}{2}} = \frac{x^{\frac{3}{4} \cdot \frac{1}{2}} y^{\frac{2}{3} \cdot \frac{1}{2}}}{x^{\frac{1}{3} \cdot \frac{1}{2}} y^{\frac{5}{2} \cdot \frac{1}{2}}} = \frac{x^{\frac{3}{8}} y^{\frac{1}{3}}}{x^{\frac{1}{6}} y^{\frac{5}{4}}} = \boxed{\frac{x^{\frac{5}{24}}}{y^{\frac{11}{12}}}}$ ^{ANS}

EX $\frac{3 \cdot 3}{8} - \frac{1 \cdot 1}{6} = \frac{9-4}{24} = \frac{5}{24}$

lcd:
24

EX $\frac{1 \cdot 4}{3} - \frac{5 \cdot 3}{4} = \frac{4-15}{12} =$

or

lcd:
12 $\frac{5 \cdot 3}{4} - \frac{1 \cdot 4}{3} = \frac{15-4}{12} = \frac{11}{12}$

EX $\sqrt[3]{x} \sqrt{x} = x^{\frac{1}{3}} x^{\frac{1}{2}}$

lcd: 6 $\frac{1 \cdot 2}{3} + \frac{1 \cdot 3}{2} = \frac{2+3}{6} = x^{\frac{5}{6}} = \boxed{\sqrt[6]{x^5}}$ ^{ANS}

or

$\sqrt[6]{x^2} \sqrt[6]{x^3} = \sqrt[6]{x^2 x^3} = \boxed{\sqrt[6]{x^5}}$ ^{ANS}

$$\sqrt[2]{\sqrt[3]{\sqrt[4]{x}}} = \left(\left(x^{\frac{1}{4}} \right)^{\frac{1}{3}} \right)^{\frac{1}{2}} = x^{\frac{1}{24}} = \sqrt[24]{x}$$

$$2 \cdot 3 \cdot 4 = 24 \sqrt{x}$$