OCTOBER 31, 2012
SECTION 7.2 (NOTATIONS)

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

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

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

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

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

$64 = 2 \cdot 32$
$32 = 2 \cdot 16$
$16 = 2 \cdot 8$
$8 = 2 \cdot 4$
$4 = 2 \cdot 2$

Shortcut

$8^{\frac{2}{3}} = 2^2 = 4$

ex $8^{\frac{2}{3}}$

2 2ND Power

3 cube root

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

− move it
4 4th power
3 cube root

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

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

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

ex $-16^{-\frac{5}{4}}$

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

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

ex $(-16)^{-\frac{5}{4}}$

$\sqrt[4]{-16}$

= not real

− move it
5 5th power
4 4th root

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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

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

LCD: 24

(y) $\frac{1}{3} \cdot \frac{4}{4} - \frac{5}{4} \cdot \frac{3}{3} = \frac{4-15}{12} =$

or

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

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

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

or

b) $\sqrt[3]{x^1}\sqrt[2]{x^1} = \sqrt[6]{x^2}\sqrt[6]{x^3} = \boxed{\sqrt[6]{x^5}}$ ANS

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

$$2 \cdot 3 \cdot 4 = 24$$

$$\sqrt{x}$$