Exponents and Radicals.

Thursday, January 25, 2018 1:00 PM

$$X^4 = X \cdot X \cdot X \cdot X$$

$$2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$$

$$\left(\frac{2}{3}\right)^7 = \frac{2^7}{3^7} = \frac{128}{2187}$$

$$(3x)^4 = 3^4 \cdot x^4$$

$$= 81x^4$$

$$(4x^3)^2 = 4 \cdot 4 \cdot x^3 \cdot x^3$$

$$16x^6$$

$$(4x^3)^7 = 16{,}384x^{21}$$

Know:

$4^3 = 64$

$2^6 = 64$ $\quad 2^3 = 8$

$8^2 = 64$

$$(2x^7)^3 = 2^3 \cdot x^7 \cdot x^7 \cdot x^7$$

$$= 8x^{21}$$

Know:

$x^0 = 1$

$5^0 = 1 \quad (-7)^0 = 1$

old. $\frac{x^5}{x^3} = x^2$

subtract exponents.

$\frac{x^5}{x^5} = 1$

$\Rightarrow x^{5-5} = x^0$

$x \neq 0$

$x^3 \cdot x^4 = x^7$ add exponents Confuse >

$(x^3)^4 = x^{12}$ multiply exponents.

$$\frac{(x^3)^4 \cdot x^3}{x^{12} \cdot x^3}$$

$$x^{15}$$

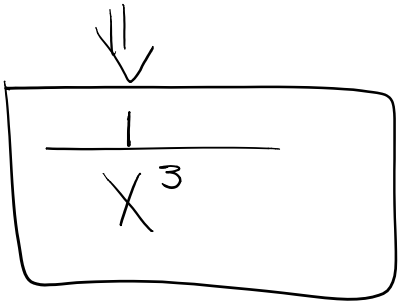
$$\left(\frac{a^2}{b^4}\right)^{10} = \frac{a^{20}}{b^{40}}$$

$$x^{-3} = \frac{1}{x^3}$$

$$\Downarrow$$

$$x^{-3}$$

$$\frac{x^{-3}}{1}$$ move to other place in fraction



$$\frac{x^{-4}}{b^{-7}} = \frac{b^7}{x^4}$$

$$\frac{3a^{-7}b^4}{b^{-3}a^{10}} = \frac{3b^4b^3}{a^7 \cdot a^{10}}$$

$$= \frac{3b^7}{a^{17}}$$

Radicals

$$\sqrt{12} = \sqrt{4}\cdot\sqrt{3}$$
$$= 2\sqrt{3}$$

$4 = 2^2$

$\sqrt{4} = \sqrt{2^2}$

$$\sqrt{75} = \sqrt{25}\cdot\sqrt{3}$$
$$= 5\sqrt{3}$$

$$\sqrt{2\cdot 2\cdot 2\cdot 2\cdot 5\cdot 5\cdot 5\cdot 3\cdot 3}$$

$$2\cdot 2\cdot 5\cdot 3\sqrt{5}$$

$$60\sqrt{5}$$

$$\sqrt[3]{8} = \sqrt[3]{2\cdot 2\cdot 2} = 2$$

$$\sqrt[5]{64} = \sqrt[5]{2\cdot 2\cdot 2\cdot 2\cdot 2\cdot 2}$$
$$= 2\sqrt[5]{2}$$

$2^3 = 8$

$2^4 = 16$

$2^5 = 32$

$2^6 = 64 \longrightarrow 4^3 = 64 \longrightarrow 8^2 = 64$

$\sqrt[5]{64} = (64)^{1/5}$

$= (32 \cdot 2)^{1/5}$

$= (2^5 \cdot 2)^{1/5}$

$= (2^5)^{1/5} \cdot 2^{1/5}$

$2 \cdot \sqrt[5]{2}$

$\sqrt[5]{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}$

$2 \cdot \sqrt[5]{2}$

$\sqrt{16a^{10}}$

$4a^5$

Prime Factor

2 | 96

2 | 48

$\sqrt{96} = 2 \cdot 2 \cdot \sqrt{2 \cdot 3}$

$= 4\sqrt{6}$

2 | 48
2 | 24
2 | 12
2 | 6
3 | 3
1

$\sqrt{75} = 5\sqrt{3}$

3 | 75
5 | 25
5 | 5
1

$\sqrt{24} = 2\sqrt{6}$

2 | 24
2 | 12
2 | 6
3 | 3
1

$\sqrt[3]{16x^5}$

three of them

2 | 16
2 | 8
2 | 4
2 | 2

x
x
x
x

$\sqrt{16x^{\cdot}}$

three of them

2 | 8
2 | 4
2 | 2
1

X X X X

$2 \cdot x \sqrt[3]{2x^2}$

$\sqrt[3]{x^{17}}$

$\sqrt[3]{x^{15} \cdot x^2}$

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

$\sqrt[5]{32\,a^{40}}$

2 | 32
2 | 16
2 | 8
2 | 4
2 | 2
1

$\sqrt[5]{32}$ $\sqrt[5]{a^{40}}$

$2 \quad a^8$

$(32\,a^{40})^{2/5}$

$\left(\sqrt[5]{32\,a^{40}}\right)^2$

$$(2a^8)^2$$

$$4a^{16}$$

$$\sqrt[5]{a^7} = a^1\sqrt[5]{a^2}$$

$$\sqrt[3]{x^{10}} = x^3\sqrt[3]{x^1}$$