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Exponents and Radical Expressions: (P-2)

I. Positive integer exponents:

Example: 2^3

II. Zero as an exponents: 2^0

III Negative integer exponents: 2^{-3}

IV. Rational exponents: $2^{\frac{8}{9}}$

I. Positive integer exponents:

$$2^{3 \rightarrow \text{exponent + i power}}$$

$2 \rightarrow$ Base

$2^3 = 2.2.2 = 8$

$5x^3 = \rightarrow 5 \cdot x \cdot x \cdot x$

$\rightarrow$ ~~5x 5x 5x~~

The base is that factor immed. next to the exponent unless ( ) tell you differently.

Example : $\underset{\hookrightarrow \text{co-efficient}}{5}\,\underset{\hookrightarrow \text{base}}{x}^{3 \rightarrow \text{exponent}}$

$$\underset{\searrow \text{base.}}{(5x)}^{3} = 5x \cdot 5x \cdot 5x$$

$$5xy^{2} = 5 \cdot x \cdot y \cdot y.$$

$$-2^{4} = \underset{\checkmark}{\enclose{circle}{-16}} \text{ or } \underset{\times}{\enclose{circle}{16}}$$

$$= -1(2^{4}) = -16$$

$$(-2)^{4} = 16$$

$$(\text{neg.})^{\text{even}} = \text{positive}$$

$$(\text{neg.})^{\text{odd}} = \text{negetive}$$

$$(-1)^{431} = -1$$

$$(3.1415)^4 = 97.397$$

$$3.1415 \quad \overset{\boxed{x^y}}{\underset{\square^{\square}}{\boxed{\wedge}}} \quad \boxed{4} \quad \boxed{=} \quad 97.40$$

I. First prop. of exponents:

$$\underset{\text{same base}}{\underset{\backslash \quad /}{x^3 \cdot x^2}} = x.x.x.x.x = x^5$$

$$a^3 \cdot a^7 \cdot a = a^{11}$$

$$2y^6 \cdot 7y^3 = 14y^9$$

$a = a^1$

$2 = 2^1$

$\pi = \pi^1$

$$5x^2y^3z \cdot 6xyz^4 \cdot 3x^2yz^2$$

$$= (5 \cdot 6 \cdot 3)(x^2 \cdot x \cdot x^2) \cdot (y^3 \cdot y \cdot y) \cdot (z \cdot z^4 \cdot z^2)$$

$$= 90x^5y^5z^7$$

$a^4 . b^5 . c^3 = a^4 b^5 c^3$

II. 2nd prop. of exponents :

$$\begin{tikzcd} (x^3)^2 = x^{3.2} = x^6 \\ x^3 . x^3 = x^6 \arrow[u, bend right, leftrightarrow] \end{tikzcd}$$

"a power to a power"

$(a^2b^3)^5 = a^{10}b^{15}$

$(2x^2y^4)^3 = 2^3(x^2)^3 . (y^4)^3$

$= \boxed{8x^6y^{12} \; Ⓓ}$

$2^3 . 2^4 = \boxed{2^7}$

$2.2.2.2.2.2.2 = \boxed{2^7}$

A. 4^{12}
B. 4^7
C. 2^{12}
✓ D. 2^7

II. Zero as an Exponent :

$2^0 = 1$

$$\begin{tikzcd} 2^3 \cdot 2^0 \arrow[d] & = 2^{3+0} = 2^3 = \boxed{8} \arrow[dl, leftrightarrow, bend left] \\ 8 \cdot 1 = \boxed{8} & \end{tikzcd}$$

$\left(\frac{2}{3}\right)^0 = 1 \; ; \left(\frac{\pi}{11}\right)^0 = 1 \; ; (13 \cdot 9)^0 = 1 \; ; \; (-44 \cdot 6)^0 = 1$

#Any real no. to the zero power is 1.

$\boxed{\text{True}}$

#$18y^3(6y^0)^2 = 18y^3(6 \cdot 1)^2$

$= 18y^3(6)^2$

$= 18y^3 \cdot 36$

$= 18 \cdot 36\,y^3$

$= \boxed{648y^3}$

#$\left[\left(\frac{\pi}{11}\right)^2 + 4 \cdot 13^3 - 2 \cdot 7\right]^0 + 1$

$= 1 + 1$

$= \boxed{2}$

Web assign problem :

P.2.1. ⓐ $(2^{v}\cdot 3^{3})^{v} = 11664$

1. ⓑ $(-4/5)^{3}(5/4)^{v} = -\frac{\overset{1}{\cancel{5}}}{\cancel{4}}\cdot\frac{\overset{1}{\cancel{5}}}{\cancel{4}}\cdot\frac{\overset{1}{\cancel{4}}}{\cancel{5}}\cdot\frac{\overset{1}{\cancel{4}}}{\cancel{5}}\cdot\frac{4}{5}$

$= \boxed{-4/5}$

4. $6y^{v}(2y^{0})^{v}$

$= 6y^{v}(2\cdot 1)^{v}$

$= 6y^{v}\cdot 4$

$= \boxed{24y^{v}}$

$\# \; -7^{0} = \boxed{-1}$