1.4 EXPONENT LAWS (PART B) p.26

Note Title 9/15/2017

3. POWER OF POWER

ex) $[(-2)^3]^2 = (-2)^3 \cdot (-2)^3$

$= (-2)^{3+3}$

$= (-2)^6$

$= +64$

So, $(a^m)^n = a^{m \cdot n} = a^{mn}$

"KEEP THE BASE & MULTIPLY THE EXPONENTS"

④ Power of a Product

ex) $(2 \cdot 3)^4$

$= (2 \cdot 3)(2 \cdot 3)(2 \cdot 3)(2 \cdot 3)$

$= 2 \cdot 3 \cdot 2 \cdot 3 \cdot 2 \cdot 3 \cdot 2 \cdot 3$

$= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 3$

$= 2^4 \cdot 3^4$

$= 16 \cdot 81$

$= 1296$

$$\begin{array}{r} 81 \\ \times\ 16 \\ \hline 486 \\ 810 \\ \hline 1296 \end{array}$$

ex) $(3x^2y^{-1})^3 = 3^3 \cdot (x^2)^3 \cdot (y^{-1})^3$

$= 27x^6y^{-3}$

so, $(ab)^n = a^n \cdot b^n = a^n b^n$

(5) POWER OF QUOTIENT

ex) $\left(\frac{2}{3}\right)^4 = \left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)$

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

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

ex) $\left(\frac{x}{2}\right)^4 = \frac{x^4}{2^4} = \frac{x^4}{16}$

So, $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

EXAMPLES:

1) $\left[(-5)^4\right]^2 = (-5)^{4 \cdot 2} = (-5)^8$

2) $-\left(3^2\right)^7 = -\left(3^{2 \cdot 7}\right)$

$= -3^{14}$

3) $(2x^2y^3)^4 = 2^{1 \cdot 4} x^{2 \cdot 4} y^{3 \cdot 4}$

$= 2^4 x^8 y^{12}$

$= 16x^8y^{12}$

4) $[(-4)(-2)]^3 = (-4)^3 \cdot (-2)^3$

USING EXPONENT LAWS

$= (-64) \cdot (-8)$

$= 512$

OR

$[(-4)(-2)]^3 = [8]^3$

$= 512$

USING BEDMAS

5) $-[5(-4)]^2 = -[5^2 \cdot (-4)^2]$

USING EXPONENT LAWS

$= -[25 \cdot 16]$

$= -400$

OR

$-[5(-4)]^2 = -[-20]^2$

USING BEDMAS

$= -(400)$

$= -400$

p. 30 - 31 NOVICE # 1 - 4

APPRENTICE # 1 - 13

EXPERT # 1 - 20