

# More Exponent Laws.

Friday, September 27, 2019 8:41 AM

Simplify:

Review: ①  $x^2 \cdot x^3 = x^5$  ②  $(x^2)^4 = x^8$

③  $\frac{x^7}{x^2} = x^5$  ④  $x^0 = 1$

$$\begin{aligned}(2 \times 5)^3 &= (2 \times 5) \times (2 \times 5) \times (2 \times 5) \\ &= 2 \times 2 \times 2 \times 5 \times 5 \times 5 \\ &= 2^3 \times 5^3\end{aligned}$$

Exponent Law # 4:  $(x^{\overbrace{y}^n})^n = x^n y^n$

$$\begin{aligned}(2x)^3 &= \underline{2^3} \cdot x^3 \\ &= 8x^3\end{aligned}$$

↑  
mixed  
base

For mixed bases  
when simplifying,  
evaluate the  
numeric part.

$$(4y)^2 = 4^2 \cdot y^2 = 16y^2$$

$$\begin{aligned}(2x^3)^4 &= 2^4 \cdot (x^3)^4 \\ &= 16x^{12}\end{aligned}$$

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

Try: Simplify:

$$\begin{aligned}① (-3y)^2 &= (-3)^2 y^2 \\ &= 9y^2\end{aligned}$$

$$\begin{aligned}② (2x^2y)^3 &= 2^3 \cdot (x^2)^3 \cdot y^3 \\ &= 8x^6y^3\end{aligned}$$

$$\boxed{(-3y)^2}$$

$$\begin{array}{l} - (3^2 \cdot y^2) \\ - 9y^2 \end{array}$$

$$\left(\frac{2}{3}\right)^3 = \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} = \frac{2^3}{3^3} = \frac{8}{27}$$

Exponent Law # 5:  $\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$

$$\left(\frac{3}{5}\right)^2 = \frac{3^2}{5^2} = \frac{9}{25}$$

$$\left(\frac{x}{5}\right)^3 = \frac{x^3}{5^3} = \frac{x^3}{125}$$

$$\left(\frac{2x}{y}\right)^3 = \frac{(2x)^3}{y^3} = \frac{2^3 x^3}{y^3} = \frac{8x^3}{y^3}$$

Try: Simplify:

$$\textcircled{1} \left(\frac{x^2}{4}\right)^2 = \frac{x^2}{4^2} = \frac{x^2}{16}$$

$$\textcircled{2} \left(\frac{2x}{y^2}\right)^4 = \frac{2^4 \cdot x^4}{y^4} = \frac{16x^4}{y^4}$$

$$\textcircled{3} \left(\frac{x^{\frac{1}{2}}}{y^3}\right)^3 = \frac{(x^{\frac{1}{2}})^3}{(y^3)^3} = \frac{x^{\frac{3}{2}}}{y^9}$$

← (4)

$$\text{eg } \left( \frac{-2x^2}{3y^3} \right)^4 = \frac{(-2)^4 \cdot (x^2)^4}{3^4 \cdot (y^3)^4} = \frac{16x^8}{81y^{12}}$$

$$\underbrace{3 \cdot 3 \cdot 3 \cdot 3}_9 \cdot \underbrace{3 \cdot 3}_9$$

y'

$$\text{Try } \left( \frac{-4x^3}{5y^4} \right)^2 = \frac{(-4)^2 \cdot (x^3)^2}{5^2 \cdot (y^4)^2} = \frac{16x^6}{25y^8}$$

## Quiz

1 a) Base = 6  
3

②  $(-2)^6 = 64 \quad \downarrow \textcircled{2^6} = -64$

③  $-(3^4) = -81$

④  $7^4 \cdot 7^2 = 7^6$

⑤  $(-8)^9 \div (-8)^3 = (-8)^6$

⑥  $(-1)^{\text{odd}}$  eg  $(-1)^5$   $(-1)^5$   
 $-1$  any exponent eg  $-1^8$   $(-1)^3$

$-(\text{any}\#)^0 = -(1256)^0$

$$\textcircled{7} [(-2)^2]^3 = (-2)^6 = 64$$

$$\textcircled{8} \frac{(-5)^6 \cdot (-5)^4}{(-5)^2} = \frac{(-5)^{10}}{(-5)^2} = (-5)^8$$

$\textcircled{1}$                                    $\textcircled{1}$

Try:  $\left(\frac{-2x^3}{-3y^4}\right)^3 = \frac{(-2)^3 \cdot (x^3)^3}{(-3)^3 \cdot (y^4)^3} = \frac{-8x^9}{27y^{12}}$

$$= \frac{8x^9}{27y^{12}}$$
  
$$\frac{-3}{-4} = \frac{3}{4}$$