

Raising a Fraction to a Power

* If a fraction in parentheses is raised to a power, raise both the numerator and the denominator to the power.

$$\left(\frac{X^2}{Y^3}\right)^4 = \frac{X^{2 \cdot 4}}{Y^{3 \cdot 4}} = \frac{X^8}{Y^{12}}$$

$$\underline{2^3 = 2 \cdot 2 \cdot 2}$$

$$\left(\frac{2^1}{Y^2}\right)^3 = \frac{2^{1 \cdot 3}}{Y^{2 \cdot 3}} = \frac{2^3}{Y^6} = \left(\frac{8}{Y^6}\right)$$

$$\left(\frac{4^1}{Y^1}\right)^2 = \frac{4^{1 \cdot 2}}{Y^{1 \cdot 2}} = \frac{4^2}{Y^2} = \left(\frac{16}{Y^2}\right)$$

✓ ① $\left(\frac{Y^3}{X^2}\right)^4 = \frac{Y^{3 \cdot 4}}{X^{2 \cdot 4}} = \left(\frac{Y^{12}}{X^8}\right)$

✓ ② $\left(\frac{X^3}{2^1}\right)^3 = \frac{X^{3 \cdot 3}}{2^{1 \cdot 3}} = \frac{X^9}{2^3} = \left(\frac{X^9}{8}\right)$

✓ ③ $\left(\frac{2X^2}{Y^3}\right)^2 = \frac{2^{1 \cdot 2} X^{2 \cdot 2}}{Y^{3 \cdot 2}} = \frac{2^2 X^4}{Y^6} = \left(\frac{4X^4}{Y^6}\right)$
 $3^3 = \underline{3 \cdot 3 \cdot 3}$

✓ ④ $\left(\frac{3y^2}{x^2}\right)^3 = \frac{3^{1 \cdot 3} y^{2 \cdot 3}}{x^{2 \cdot 3}} = \frac{3^3 y^6}{x^6} = \left(\frac{27y^6}{x^6}\right)$

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