

Division of Monomials Raised to a Power

Simplify each monomial. Show your work/thinking; all final answers must have positive exponents.

1.
$$\left(\frac{2x^4y^{12}}{y^{10}}\right)^3$$

2.
$$\left(\frac{4x^7y^{20}}{xy^{18}}\right)^3$$

3.
$$\left(\frac{10x^7y^{20}}{5x^{10}y^{18}}\right)^3$$

4.
$$\left(\frac{18x^{13}y^{17}}{12x^{12}y^{12}}\right)^3$$

5.
$$\left(\frac{7x^{11}y^5}{14x^{11}y^{25}}\right)^3$$

6.
$$\left(\frac{-2x^{22}y}{6x^{30}y^5}\right)^3$$

$$7. \left(\frac{44x^{23}y^{84}}{66x^{20}y^{87}} \right)^3$$

$$8. \left(\frac{420x^{108}y^{15}z^3}{840x^{112}y^4z^6} \right)^5$$

$$9. \left(\frac{x^{47}y^{20}}{-2x^{45}y^{20}} \right)^4$$

$$10. \left(\frac{-25x^{118}y^{112}}{5x^{114}y^{115}} \right)^2$$

$$11. \left[\left(\frac{24y^{18}z^5}{18x^2y^{20}} \right) \cdot \left(\frac{15x^{10}y^4}{20z^2} \right) \right]^3$$

$$12. \left[\left(\frac{18x^{32}y^{58}}{5x^{37}y^{32}} \right) \cdot \left(\frac{-25x^4}{9y^{10}} \right) \right]^4$$