

$$\frac{(x^3 y^2)^{-2}}{x^4 y} \cdot \frac{x y^2}{(x^8 y)^{-3}} \cdot \left(\frac{x^4 y^2}{x y^4} \right)^2 \cdot \left(\frac{x y}{x^3 y^{-2}} \right)^{-3}$$

$$\frac{x^{-6} y^{-4}}{x^4 y} \cdot \frac{x y^2}{x^{-24} y^{-3}} \cdot \frac{x^8 y^4}{x^2 y^8} \cdot \frac{x^{-3} y^{-3}}{x^{-9} y^6} =$$

$$\frac{x^0 y^{-1}}{x^{-27} y^{12}} = x^{27} y^{-13} = \frac{x^{27}}{y^{13}}$$

$$\left(\frac{y^{10}}{x^8}\right)^{1/2} \cdot \frac{4xy^3}{(2x^2y)^3} = \frac{y^5}{x^4} \cdot \frac{4xy^3}{2^3x^6y^3}$$

$$\frac{4xy^8}{8x^{10}y^3} = \frac{1x^{-9}y^5}{2} = \frac{y^5}{2x^9}$$

Rule #7 $\sqrt[m]{a^n} = a^{n/m}$

$$\sqrt{4} = 2$$

$$\sqrt{2^2} = 2^{2/2} = 2$$

$$(2^2)^{1/2} \rightarrow 2$$

$$\sqrt[3]{x^6} = x^{6/3} = x^2$$

$$\sqrt[4]{x^8 y^3} = (x^8 y^3)^{1/4} \\ = x^2 y^{3/4}$$

$$\sqrt[3]{27y^6z^3} =$$

$$(3^3 y^6 z^3)^{\frac{1}{3}}$$

$$3y^2z$$

$$27 = 3^3$$

$$\begin{array}{c} \diagup \quad \diagdown \\ 3 \quad 9 \\ \quad \diagup \quad \diagdown \\ \quad 3 \quad 3 \end{array}$$

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Simplify the expression. Tell which properties of exponents you used. (Lesson 6.1)

13. $(32x^2)^4$

14. $(x^2y^2)^{-3}$

15. $\frac{x^8}{x^5}$

16. $\frac{4x^4y^7}{8x^5y^3}$

17. $(6x^3y^4)^{-2}$

18. $-4(x^{-5}y^2)^2$

19. $(-3x^9y^3)^{-7}$

20. $(6x^{-3}y^{-1})^{-8}$

21. $(8(x^3y^4)^2)^{-2}$

22. $\frac{2x^{-3}y^{-5}}{3x^{-6}y^{-3}}$

23. $\frac{x^{10}}{3y^4} \cdot \frac{9x^2y^2}{x^4y^3}$

24. $\frac{15xy^4}{8x^3y^0} \cdot \frac{16x^5y^2}{5y^4}$