Additional Practice

All work should be done in your notebook. Final answer should contain only positive exponents.

Remember: Whenever a term is raised to a negative exponent, that means you are dividing by that term to the positive exponent. When you are dividing by a term, it gets moved to the other side of the division bar.

22. $\dfrac{m^{-2}n^{-5}}{(m^4n^3)^{-1}}$

$= \dfrac{(m^4n^3)^1}{m^2n^5}$

$= \dfrac{m^4n^3}{m^2n^5}$

$= \dfrac{m^2}{n^2}$

23. $\dfrac{(j^{-1}k^3)^{-4}}{j^3k^3}$

$= \dfrac{1}{j^3k^3(j^{-1}k^3)^4}$

$= \dfrac{1}{j^3k^3j^{-4}k^{12}}$

$= \dfrac{j^4}{j^3k^{15}}$

$= \dfrac{j}{k^{15}}$

24. $\dfrac{(2a^{-2}b)^{-3}}{5a^2b^4}$

$= \dfrac{1}{(2a^{-2}b)^3 \cdot 5a^2b^4}$

$= \dfrac{1}{8a^{-6}b^3 \cdot 5a^2b^4}$

$= \dfrac{a^6}{40a^2b^7}$

$= \dfrac{a^4}{40b^7}$

--- **Distributing the negative exponent first.** ---

$= \dfrac{m^{-2}n^{-5}}{m^{-4}n^{-3}}$

$= \dfrac{m^2}{n^2}$

$\dfrac{(j^{-1}k^3)^{-4}}{j^3k^3} = \dfrac{j^4k^{-12}}{j^3k^3}$

$= \dfrac{j^4}{j^3 \cdot k^3 \cdot k^{12}}$

$= \dfrac{j}{k^{15}}$

$= \dfrac{a^6b^{-3}}{2^3 \cdot 5 \cdot a^2 \cdot b^4}$

$= \dfrac{a^4}{40b^7}$

25. $\left(\dfrac{q^{-1}r^3}{qr^{-2}}\right)^{-5}$

$= \left(\dfrac{r^3 \cdot r^2}{q \cdot q}\right)^{-5}$

$= \left(\dfrac{r^5}{q^2}\right)^{-5}$

$= \left(\dfrac{q^2}{r^5}\right)^5$

$= \dfrac{q^{10}}{r^{25}}$

26. $\left(\dfrac{7c^{-3}d^3}{c^5de^{-4}}\right)^{-1}$

$= \left(\dfrac{7d^3e^4}{c^3 \cdot c^5 \cdot d}\right)^{-1}$

$= \left(\dfrac{7d^2e^4}{c^8}\right)^{-1}$

$= \dfrac{c^8}{7d^2e^4}$

27. $\left(\dfrac{2x^3y^2z}{3x^4yz^{-2}}\right)^{-2}$

$= \left(\dfrac{2y \cdot z \cdot z^2}{3x}\right)^{-2}$

$= \left(\dfrac{2yz^3}{3x}\right)^{-2}$

$= \left(\dfrac{3x}{2yz^3}\right)^2$

$= \dfrac{9x^2}{4y^2z^6}$

--- **Distributing the negative exponent first.** ---

$= \dfrac{q^5r^{-15}}{q^{-5}r^{10}}$

$= \dfrac{q^{10}}{r^{25}}$

$= \dfrac{7^{-1}c^3d^{-3}}{c^{-5}d^{-1}e^4}$

$= \dfrac{c^8}{7d^2e^4}$

$= \dfrac{2^{-2}x^{-6}y^{-4}z^{-2}}{3^{-2}x^{-8}y^{-2}z^4}$

$= \dfrac{9 \, x^2}{4y^2z^6}$