

Name: _____

3.5 Applying Exponent Laws (Part 2)

1. Simplify each question and express your answer with positive exponents.

a) $(x^{-2})^5 = x^{-10}$	b) $\left(\frac{2}{9}\right)^{-\frac{1}{4}} \times \left(\frac{2}{9}\right)^{\frac{1}{4}} = \left(\frac{2}{9}\right)^0 = 1$
c) $\frac{(0.5)^2}{(0.5)^{-3}} = 0.5^{2-(-3)}$ $= 0.5^5$ $= \left(\frac{1}{2}\right)^5 = \frac{1}{32}$	d) $\left(\frac{3}{2}m^{-2}n^{-3}\right)^{-2} = \frac{3^{-2}m^4n^6}{2^{-2}}$ $= \frac{2^2m^4n^6}{3^2} = \frac{4m^4n^6}{9}$
e) $(4m^2n^3)^{-3}$ $4^{-3}m^{-6}n^{-9}$ $= \frac{1}{4^3m^6n^9} = \frac{1}{64m^6n^9}$	f) $(x^{-1}y^{-2})^{-3}$ x^3y^6
g) $(a^3b^2)(a^2b^3)$ a^5b^5	h) $(a^{-1}b^{-2})(a^{-2}b^{-3})$ $a^{-3}b^{-5} = \frac{1}{a^3b^5}$
i) $\frac{a^{-4}b^5}{ab^3} = a^{-4-1} \cdot b^{5-3}$ $= a^{-5}b^2$ $= \frac{b^2}{a^5}$	j) $(8a^3b^6)^{\frac{1}{3}}$ $8^{\frac{1}{3}}a^1b^2$ $\sqrt[3]{8}ab^2 = 2ab^2$
k) $(m^{\frac{2}{3}})(m^{\frac{1}{3}})$ $m^{\frac{2}{3} + \frac{1}{3}}$ m^1 m	l) $\frac{x^{-\frac{3}{2}}}{x^{-\frac{1}{4}}}$ $x^{-\frac{3}{2} - (-\frac{1}{4})}$ $x^{-\frac{6}{4} + \frac{1}{4}}$ $x^{-\frac{5}{4}}$ $x^{-\frac{5}{4}}$ $\frac{1}{x^{\frac{5}{4}}}$

$m) \left[\left(-\frac{3}{5} \right)^{-3} \right]^{-2} = \left(-\frac{3}{5} \right)^6$	$n) (2a^{-2}b^2)^{-2}$ $2^{-2} a^4 b^{-4}$ $\frac{a^4}{4b^4}$
$o) (x^2y^{-3})(x^{\frac{1}{2}}y^{-1})$ $\begin{matrix} 2+\frac{1}{2} & -3+(-1) \\ X \cdot Y & \\ \frac{5}{2} & -2 \\ X & Y \end{matrix}$ $\frac{X^{5/2}}{Y^2}$	$p) \left(\frac{-5a^2}{b^{\frac{1}{2}}} \right)^{-2} = \frac{(-5)^{-2} a^{-2}}{b^{-1}}$ $= \frac{b}{25a^4}$
$q) \frac{(m^{-3}n^2)^{-4}}{(m^2n^{-3})^2} = \frac{m^{12}n^{-8}}{m^4n^{-6}}$ $= m^8n^{-2} = \frac{m^8}{n^2}$	$r) (r^{\frac{3}{2}}s^2)(r^{\frac{1}{2}}s^{-1})$ $\begin{matrix} \frac{3}{2}+\frac{1}{2} & 2+(-1) \\ r \cdot s \end{matrix}$ $r^{4/2} \cdot s^1 = r^2s$
$s) \frac{4a^{-2}b^{\frac{2}{3}}}{2a^2b^{\frac{1}{3}}} = 2a^{-4}b^{\frac{1}{3}} = \frac{2b^{\frac{1}{3}}}{a^4}$	$t) \left(\frac{a^{-1}b^3}{a^{-2}b^5} \right)^{-2} = (a^1b^{-2})^{-2}$ $= a^{-2}b^4$ $= \frac{b^4}{a^2}$
$u) \frac{(a^2b^{-1})^{-2}}{(a^{-3}b)^3} = \frac{a^{-4}b^2}{a^{-9}b^3} = a^5b^{-1}$ $= \frac{a^5}{b}$	$v) \left(\frac{(c^{-3}d)^{-1}}{c^2d} \right)^{-2} = \left(\frac{c^3d^{-1}}{c^2d} \right)^{-2}$ $= (cd^{-2})^{-2}$ $= c^{-2}d^4 = \frac{d^4}{c^2}$
$w) \frac{4^0x^3y}{x^{-3}y} = 1x^6y^0$ $= x^6$	$x) \frac{(2a^{-1}b^4c^{-3})^{-2}}{(4a^2bc^{-4})^2} = \frac{2^{-2}a^2b^{-8}c^6}{4^2a^4b^2c^{-8}}$ $= \frac{a^{-2}b^{-10}c^{14}}{4 \cdot 16}$ $= \frac{c^{14}}{64a^2b^{10}}$