Exponent Laws

Recall the exponent laws:

Product of powers:	$x^m \cdot x^n = x^{m+n}$
Quotient of powers:	$x^m \div x^n = x^{m-n} \quad x \neq 0$
Power of a power:	$(x^m)^n = x^{mn}$
Power of a product:	$(xy)^m = x^m y^m$
Power of a quotient:	$\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}, \quad y \neq 0$

Simplify by writing as a single power (no negative exponents!)

Ex 1) $(x^{-3})(x^{-2}) = x^{-5}$

$= \frac{1}{x^5}$

Ex 2) $(y^{-3})(y^4)(y^{-5}) = y^{-4}$

$= \frac{1}{y^4}$

Ex 3) $\frac{x^{-2}}{x^5} = x^{-7}$

$= \frac{1}{x^7}$

$\frac{x^{-2}}{x^{-5}} = x^{-2-(-5)} = x^3$

Ex 4) $(x^3)^{-4} = x^{-12}$

$= \frac{1}{x^{12}}$

Ex 5) $(x^3)^{-\frac{5}{2}} = x^{\frac{3}{1}\cdot\frac{-5}{2}}$

$= x^{\frac{-15}{2}}$

$= \frac{1}{x^{15/2}}$

Ex 6) $(x^2y^{-3})^{-2} = (x^2)^{-2}(y^{-3})^{-2}$

$= x^{-4}y^6$

$= \frac{1}{x^4}\cdot y^6$

$= \frac{y^6}{x^4}$

Ex 7) $(2x^{-3})^3$ $(2)^3(x^{-3})^3$ $(-2x^{-3})^3$ $(2x^3)^{-3}$

$8x^{-9}$ $-8x^{-9}$ $(2)^{-3}x^{-9}$

$\frac{8}{x^9}$ $\frac{-8}{x^9}$ $\frac{1}{8x^9}$

Ex 8) $\frac{-24x^{-2}}{-8x^4} = 3x^{-6}$

$= \frac{3}{x^6}$

$\frac{-8x^{-2}}{-24x^4} = \frac{1x^{-6}}{3}$

$= \frac{1}{3x^6}$

Ex 9) $m^4n^{-2}\cdot m^2n^3 = (m^4m^2)\cdot(n^{-2}n^3)$

$= m^6n$