

TOPIC: SIMPLIFYING EXPONENTIAL EXPRESSIONS USING ALL EXPONENT RULES

Simplifying Exponential Expressions

◆ You'll often have to use multiple exponent rules to fully simplify expressions. Use this checklist!

► There's no "correct" order in using rules but *usually* it's easiest to simplify from inner-most expression outward.

EXAMPLE: Simplify the expressions.	Expressions are fully simplified when:	Name	Rule
(A) $(3x^{-5})^2 \cdot (-2x^4)^3$	✓ No <u>powers</u> raised to other <u>powers</u>	Power Rules	$(a^m)^n = a^{m \cdot n}$
	✓ No <u>parentheses</u>		$(a \cdot b)^m = a^m \cdot b^m$
	✓ No <u>same bases</u> multiplied or divided (e.g. $x^2 \cdot x^4$, $\frac{y^7}{y^4}$)		$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$ Product & Quotient Rules
(B) $\left(\frac{x^2y^7}{x^5y^4}\right)^{-1}$	✓ No <u>zero</u> exponents	Zero Exp. Rule	$a^0 = 1$
	✓ No <u>negative</u> exponents	Negative Exp. Rule	$a^{-n} = \frac{1}{a^n}$
	✓ All numbers with exponents <u>evaluated</u>	Base 1	$1^n = 1$
		Neg to Even Power	$(-a)^{\text{even}} = a^{\text{even}}$
		Neg to Odd Power	$(-a)^{\text{odd}} = -a^{\text{odd}}$
	✓ All operations ($\times, \div, +, -$) performed		