

Name: Key

Date: _____

Polynomial Rules

To Add and Subtract Polynomials:

- combine like terms (same variable and same exponent)
- add/subtract coefficients
- keep the base and do not change the exponents
- write all answers in standard form

Ex: $2x^2 + 3x^2 = 5x^2$

*Standard form is when terms are written in order from greatest exponent to least exponent.

↓
Descending power order

To Multiply Monomials and Polynomials:

- distribute by multiplying the coefficients
- add the exponents of the like bases

Ex ① $2x^2 \cdot 4x^5 = 8x^7$

② $(x+6)(x-5) = x^2 - 5x + 6x - 30 = x^2 + x - 30$
 Dable Distribute

③ $(x-4)^2 = (x-4)(x-4) = x^2 - 4x - 4x + 16 = x^2 - 8x + 16$
 write twice 1st

Ex ① $\frac{10x^5}{5x^2} = 2x^3$

To Divide Monomials and Polynomials:

- if it applies, rewrite each term of the polynomial divided by the monomial
- divide the coefficients
- subtract the exponents of the like bases
- Negative exponents go in the denominator and make the exponent positive
- Positive exponents go in the numerator
- Coefficients always go in the numerator

② $\frac{8x^3 + 4x^2 + 2x}{2x} = \frac{8x^3}{2x} + \frac{4x^2}{2x} + \frac{2x}{2x} = 4x^2 + 2x + 1$

To Use the Power Rule:

- raise the coefficient to the power outside the parentheses
- raise each base with an exponent to that same power and multiply the exponents

Ex ① $(x^2)^4 = x^8$ or $(x^2)(x^2)(x^2)(x^2) = x^8$

② $(2x^3y^4)^3 = (2)^3 \cdot (x^3)^3 \cdot (y^4)^3 = 8x^9y^{12}$
 or $(2x^3y^4)(2x^3y^4)(2x^3y^4) = 8x^9y^{12}$

To Make a Negative Exponent Positive:

- Write its reciprocal (flip) and make the exponent positive

Ex ① $5^{-3} = \frac{1}{5^3} = \frac{1}{125}$ ② $x^{-2} = \frac{1}{x^2}$

To Simplify a Non-Zero Value with a Zero Exponent:

- any non-zero value raise to the zero exponent has a value of 1

Ex ① $5^0 = 1$ ② $(3x)^0 = 1$ ③ $0^0 = 1$