



# 5-1 Operations with Polynomials

I can perform operations on polynomials expressions.

Nov 13-12:23 PM

**Polynomial:** any expression that can be written as a combination of terms with variable(s) raised to an integer power (non-negative).

*NO decimal exponents/fraction exp*

We will use one variable polynomials for the most part in this chapter.

**Variables of polynomials use** only the operations of addition, multiplication and subtraction. You must be able to write it without division of variables, square roots of variables or negative exponents in the numerator!

Jan 27-9:02 AM

**Examples:**

$$\rightarrow y = x^3 + 9x^2 + 26x + 24$$

$$y = 3x^4 + 2x^8$$

$$2xyz + x$$

$$y = 2x^4 + 9x^2 + 6x$$

$$\rightarrow y = \frac{24}{2x^{-3}} + 9x^2 + 6x = 12x^3 + 9x^2 + 6x$$

$$y = 12x^3y + 9x^2 + 5y$$

**Non-Examples:**

$$y = \frac{1}{x} = x^{-1}$$

$$y = 4x^{-2} + 3x$$

$$y = \sqrt{x} = x^{\frac{1}{2}}$$

$$y = 3x^4 + 2x^{2.5}$$

$$y = \frac{124}{2x^4} + 9x$$

Apr 3-8:27 AM

Are these polynomials, simplify and state yes/no.

$$y = \frac{(5x + 1)}{(3x)}$$

$$y = \frac{(6x^2 + 3x)}{(3x)}$$

$$y = \sqrt{x} + 3x^2 + 5$$

$$y = -\frac{2}{3}x^2 + \frac{3}{5}x^3 + \frac{5}{12} + \frac{5}{8}x$$

Apr 3-8:29 AM

**degree**: the power of the term that has the highest exponent in a polynomial

**Examples:**

$$y = x^3 + 9x^2 + 26x + 24 \quad \text{3rd Degree}$$

$$y = 3x^4 + 2x^8 = 2x^8 + 3x^4 \quad \text{8th Degree}$$

$$y = 7x^6 + 5x^4 - 12x^3 + 8x - 41 \quad \text{6th Deg.}$$

**Standard form:**

polynomial written so that the degrees of the terms decrease from left to right.

Mar 16-9:25 AM

Simplifying polynomials: +/- DO NOT CHANGE exponents  
(combine like terms).

$$(4x^2 - 5x + 6) + (2x^2 + 3x - 1) =$$

$$6x^2 - 2x + 5$$

$$(4x^2 - 5x + 6) - (2x^2 + 3x - 1) =$$

$$-2x^2 - 3x + 7$$

$$2x^2 - 8x + 7$$

Feb 1-10:05 AM

Simplifying polynomials:

$$4x^2(2x^2 - 1) =$$

$$8x^4 - 4x^2$$

$$3x^3(3x^2 - 5) =$$

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$$(4x^2 - 5x + 6)(2x^2 - 1) =$$

$$(2x^2 - 1)(4x^2 - 5x + 6)$$

$$8x^4 - 10x^3 + 12x^2$$

$$+ \quad \quad \quad - 4x^2 + 5x - 6$$


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$$8x^4 - 10x^3 + 8x^2 + 5x - 6$$

$$(2x^2 - 3x + 1)(3x^2 - 5) =$$

Feb 1-10:05 AM

Simplifying polynomials:

$$(5x + 1)(2x - 1)(x - 4) =$$

$$10x^2 - 5x + 2x - 1$$

$$(x - 4)(10x^2 - 3x - 1)$$

$$10x^3 - 3x^2 - x - 4x^2 + 12x + 4$$

$$5x(2x - 1) - 3x(x - 4) + 4x(2x - 7) =$$

$$10x^3 - 43x^2 + 11x + 4$$

Feb 1-10:05 AM

## Homework

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Simplify monomials:

#16-23 &amp; 41-50 ALL

Apply the properties to Polynomials

29-39o, 53-59o

part 1

Dec 13-7:14 AM