

What is a polynomial expression and how do you simplify them?

Monomial	expression consisting of number, variable, or product of number and variables → <i>no variable in den. & whole # exponents</i>
Term	parts of expressions that are separated by <u>plus/minus signs</u>
Polynomial	monomial or sum of monomials
	Binomial Trinomial
Degree of a polynomial	greatest value among the sum of exponents on <u>variables in one term</u> <i>3x²+x → deg. of 2 3xy → deg. of 5</i>
Standard Form	writing in order from highest to lowest degree
Combining Polynomials	<ol style="list-style-type: none"> 1) Distribute any terms (if necessary) 2) Regroup like terms (either horizontally or <u>vertically</u>) 3) Combine 4) CHECK!!!
	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px;">$-z^3 - 2z - 1$ and $2z^3 - z^2 + 2z$</div> <div style="border: 1px solid black; padding: 5px;">$(-z^3 - 2z - 1) - (-z^3 + 2z + 1)$</div> </div>
	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px;">$(18z + 12) - (11z - 5)$</div> <div style="border: 1px solid black; padding: 5px;">$-a^5 + (b^2 + a^2b^2) + (a^5 + b^2 - a^2b^2)$</div> </div>
	<p>The number of gallons of water in a leaking pool is determined by the rate that the water is filling, $8g^2 + 3g - 4$, and the rate that water leaks from the pool, $9g^2 - 2g - 5$, where g represents the number of gallons entering or leaving the pool per minute. Write an expression for the net change in gallons per minute of the water in the pool. Find the change in the amount when the rate, g, is 5 gallons per minute.</p>

Answer:

How do you multiply polynomials?

To multiply: Multiply coefficients---add exponents!

$5(x + 8)$ $8x(5x^2 - 4xy + 5y^2)$

you can use boxes to help!

x	8
$5x$	40

$5x + 40$

$5x^2$	$-4xy$	$5y^2$
$40x^3$	$-32x^2y$	$40y^2$

$40x^3 - 32x^2y + 40y^2$

Engineering Diane needs a piece of paper whose length is 4 more inches than the width, and the area is as close as possible to 50 in^2 . To the nearest whole inch, what should the dimensions of the paper be?

Multiplying Binomials

Distributive Property

$(x-1)(x+2)$ $x(x+2) - 1(x+2)$ $x(x) + (x)(2) - (1)(x) - (1)(2)$

FOIL

First, Outer, Inner, Last

$(x^2+3)(x+1)$ $(x^2)(x) + (x^2)(1) + (3)(x) + (3)(1)$

Box method

$(x-4)(x-2)$

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

$x^2 - 6x + 8$ -2

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

$(3x + 1)(x^3 + 4x^2 - 7)$

same idea!

Landscaping A landscape architect is designing a rectangular garden in a local park. The garden will be 20 feet long and 15 feet wide. The architect wants to place a walkway with a uniform width all the way around the garden. What will be the area of the garden, including the walkway?

Answer:

How can remembering the special cases help you simplify polynomial expressions?

Special Cases

$$\cancel{a^2 + b^2}$$

Perfect Square Trinomials

$$(a+b)^2 \rightarrow (a+b)(a+b) \rightarrow a^2 + 2ab + b^2$$

$$(a-b)^2 \rightarrow (a-b)(a-b) \rightarrow a^2 - 2ab + b^2$$

Difference of Squares

$$(a-b)(a+b)$$

In the perfect square trinomial $x^2 + bx + c$, what is the relationship between b and c ? Explain.

$$(4x - 3y)^2$$

$$(4 + x^2)^2$$

A square patio has a side length of $(x - 3)$ feet. It is surrounded by a flower garden with a uniform width. The side length of the entire square area including the patio and the flower garden is $(x + 3)$ feet. Write an expression for the area of the flower garden.

Answer: