

Adding, Subtracting and Multiplying Polynomials

Polynomial: a number, a variable OR the product of a number & a variable. Ex: 2, x, $2x^2$.

- * Only whole # exponents.
- * No dividing of variables.
- * No negative exponents.

Polynomials are named according to their degree and # of terms.

The degree is: highest exponent

Degree	Name	Example
0	constant	5
1	linear	$2x - 1$
2	quadratic	$5x^2 + 3$
3	cubic	$6x^3 - 2x + 3$
4	quartic	$7x^4 - x + 1$
5	quintic	$2x^5 - 3x^2 + 2$
6	6th degree	$x^6 + 2x^4$

Terms are: how many items separated by + or -.

Terms	Name	Example
1	monomial	$3x$
2	binomial	$5x - 3$
3	trinomial	$6x^3 - 4x + 4$
4 OR More	polynomial	$2x^4 + 6x^3 - 2x + 1$

Practice: Name the Polynomial

1. $-7 + 3n^3$

Cubic binomial

2. 5

constant monomial

3. $-x^4 + 3x^2 - 11$

quartic trinomial

Simplify each sum or difference:

1. $(12m^2 + 4) + (8m^2 + 5)$

$$\begin{array}{r} 12m^2 + 4 + 8m^2 + 5 \\ \hline \end{array}$$

$20m^2 + 9$

2. $(r^2 - 6) + (3r^2 + 11)$

3. $(9w^3 + 8w^2) + (7w^3 + 4)$

4. $(2p^3 + 6p^2 + 10p) + (9p^3 + 11p^2 + 3p)$

5. $(v^3 + 6v^2 - v) - (9v^3 - 7v^2 + 3v)$

$$\begin{array}{r} v^3 + 6v^2 - v - 9v^3 + 7v^2 - 3v \\ \hline \end{array}$$

$-8v^3 + 13v^2 - 4v$

$$6. (30d^3 - 29d^2 - 3d) - (2d^3 + d^2)$$

$$7. (4x^2 + 5x + 1) - (6x^2 + x + 8)$$

LAWS of EXPONENTS REVIEW: Simplify each expression

$$8) x^{-2} \cdot x^5$$

$$9) (2a^4b^{-3})(9ab^8)$$

$$10) 3x \cdot 4x^4$$

$$11) (2x^{-3})(-5x^8)$$

$$18a^{4+1} b^{-3+8}$$

$$\boxed{18a^5 b^5}$$

Multiply.

$$12) 3cd^2(4c^2d - 6cd + 14cd^2)$$

$$\boxed{12c^3d^3 - 18c^2d^3 + 42c^2d^4}$$

$$13) x^2y(6y^3 + y^2 - 28y + 30)$$

$$14) (2x + 3)(4x + 7)$$

$$15) (3b - 2c)(3b^2 - bc - 2c^2)$$

$$9b^3 - 3b^2c - 6bc^2 - 6b^2c + 2bc^2 + 4c^3$$

$$\boxed{9b^3 - 9b^2c - 4bc^2 + 4c^3}$$

$$16) (6x + 5y)(2x^2 - 3xy - 5y^2)$$

$$17) (2y^2 + 3y - 1)(3y^2 - 5y + 2)$$

$$18) (x + 4)^2$$

$$(x+4)(x+4)$$

FOIL

$$19) (6x - 1)^3$$

$$(6x-1)(6x-1)(6x-1)$$

$$(36x^2 - 6x - 6x + 1)(6x-1)$$

$$(36x^2 - 12x + 1)(6x-1)$$

$$216x^3 - 36x^2 - 72x^2 + 12x + 6x - 1$$

$$\boxed{216x^3 - 108x^2 + 18x - 1}$$