

term - a single number (a "constant") OR

a product of a number (a "coefficient") and (a) variable(s)

(always write the coefficient *first*)

terms are separated by + or - signs

polynomial - an expression formed by adding, subtracting, or multiplying terms

exponent - no fractions, no negatives

degree of a polynomial - the largest exponent of a term in a polynomial

$$8y^5 + 17y^3 - y + 6$$

the degree of this polynomial is 5

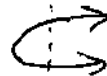
Arrange polynomial terms in descending order of exponents (highest to lowest) ending with the constant term. (*standard form*)

Polynomials with 1, 2, and 3 terms have special names.

| <u>number of terms</u> | <u>name</u> | <u>example</u> |
|------------------------|-------------|----------------|
| 1 | monomial | x^2 |
| 2 | binomial | $x^2 - 2$ |
| 3 | trinomial | $x^2 + 3x - 5$ |

Vertical Line Test -

If a vertical line passing through any part of the graph of a polynomial intersects the graph more than once, the polynomial is not a function.



Algebra I

Notes 11.1, Part 2 Simplifying Polynomials

Objectives: Re-write polynomials in standard form.

Simplify polynomials by combining like terms.

Writing the terms of a polynomial in descending order of exponents is _____ form.

Re-write these polynomials in *standard form*.

$$8x^3 + 7x^2 - 5 - x$$

$$3x^4 - 12x^3 + 5x^7$$

$$-6 + 34x^3 + 7x^2 + 2x^9$$

If a polynomial is in standard form, it is easier to identify and add like terms.

“Like terms” are terms with identical _____ and _____.

To add like terms, add the coefficients of the like terms.

Circle and add like terms (when possible). Write your answers in *standard form*.

$$8x^3 + 7x^3 =$$

$$3x^4 - 12x^3 + 5x^4 =$$

$$-4x^2 + 7x^2 + 2x^9 =$$

$$7x - 5 - x =$$

$$x^4 - 2x^4 + 5x^7 =$$

$$4x^3 + 7x^2 + 2x =$$

Simplify each polynomial in standard form.

What is the
degree of each?

$$3x^2y^3 + 4x^3 + 8x^2y^3 - 7x^3$$

$$7x^3 - 10x + 4x - 3x^2 - 8x^3 - 6x + 5$$

$$-a^2 - 7 + 6a^4 - 5a + 4a^3 - 3a^4 + 7a^2 + 5a + 5$$

Simplify each polynomial in standard form.

1. $4x^2 - 6x + 3x - 9$ 2. $6x^2 - 9x + 4x + 2$ 3. $2 + 7a^2 - 3a + 5a^2 - 6a - 7$

4. $7m^2 - 5m + 2 + 6m^2 + 9m + 4$ 5. $9a - 3a^2 + 4a - 3 + 5a^2 - 4$

6. $-8t + 3t^2 - 6 + 4t^2 - 9t - 4$ 7. $3 - 5b^2 - 4b - 9 + 4b^2 - 3b$

8. $-6 + 3m^2 - 3 - 2m^2$ 9. $-5y - 7y^2 + 6y^3 - 4y^2 + 3y^3 + 6y$

10. $5x^3 - 4x - 7x^2 + 9x - 2x^3 + 7x^2$ 11. $n^3 - 8n - 4n^2 + 8n + 3n^2 + 9n^3$

12. $8a^4 - 4a^2 + 6a^4 + 5a^2$ 13. $2a - 4a^4 + 8a + 3a^4$

14. $7q - 5q^2 + 2 + 4q$ 15. $6x^5 - 4x^3 + x^4 - 6x^6$

16. $-3m^4b + 5a^3 - 7m^4b - 6a^3$ 17. $5x^3y^2 - 4xy - 6x^3y^2 - 8xy + 5y^7$

18. $-6x^3y^2 + 4y^3 + 8x^3y^2 - 5y^3$ 19. $-7m^2 - 8m^4n^3 - 3n^2 + 2m^4n^3$

20. $-5xy^2 - 3x^5 - 4xy^2 + 2x^5$ 21. $-3a^3b^2 - 4a^2 + 5a^3b^2 + 4b^2$

22. $2 + 4a^3 - 5a - 3a^2 + 8a^3 - 9a + 5a - 6$ 23. $5b^2 - 4b - 2 + b^2 - 3b^2 + 2b^3 + 7b$

24. $x^2 + x^4 - 3x^3 - 8x - 1 + 4x^4 - 7x^3 + 9x$ 25. $7a - 5 + 8a^2 - 5a^3 + 3a^2 + 8a^3 - 6a$

Which polynomials have a degree of 4? (identify by problem number)