

Warm-up 1-13

Classify the following expressions (give the degree and number of terms), write each one in standard form, and give the leading coefficient.

1. $14xyz^2 + 3x^7y^2 - 16$

2. $8 + k + 5k^4$

3. $5h^2 - 3h^3$

4. $9a^8 - 8a^9$

5. $3c^2 + 5c^4 + 5c^3 - 4$

Warm-up 1-14

Classify the following expressions (give the degree and number of terms), write each one in standard form, and give the leading coefficient.

- $14x^4yz^2 + 3x^9y^2 - 16$
 $\textcircled{3}x^9y^2 + 14xyz^2 - 16$ Degree of 9 Trinomial
- $8 + k + 5k^4$
 $\textcircled{5}k^4 + k + 8$ Quartic Trinomial
- $5h^2 - 3h^3$
 $\textcircled{-3}h^3 + 5h^2$ Cubic Binomial
- $9a^8 - 8a^9$
 $\textcircled{-8}a^9 + 9a^8$ Degree of 9 Binomial
- $3c^2 + 5c^4 + 5c^3 - 4$
 $\textcircled{5}c^4 + 5c^3 + 3c^2 - 4$ Quartic Polynomial

Classifying Polynomials

Name by Degree	Degree	Examples	Number of Terms	Name by Terms
Constant	0	36	1	monomial
Linear	1	$14x + 2$	2	binomial
Quadratic	2	$2x^2 + 3x - 1$	3	trinomial
Cubic	3	$m^3 - 5$	2	binomial
Quartic	4	$8k^4 + 5k^2 - k + 1$	4	polynomial
Quintic	5	$-9r^5 + 5r^3 - 7r^2 + r + 3$	5	polynomial
Degree of 6	6	$x^6 - 7x + 13$	3	trinomial

Examples

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

Quadratic Polynomial

$$x^2 + 9x + 3$$

$$3c^2 + 5c^4 + 5c^3 - 4$$

Quartic Polynomial

Try These!!!

Classify the polynomials below according to its degree and number of terms.

9. $4x^2 + 5x - 3$

10. $84x^4y^3 - 3x^2y^2$

Try These!!!

Put the polynomial in standard form and then classify the polynomials below according to its degree and number of terms.

10. $5x - 6$

11. $15y - 84y^3 + 100 - 3y^2$

12. $7a^3b^4 - 2a^4 + 4b - 15$

Try These!!!

Put the polynomial in standard form and then classify the polynomials below according to its degree and number of terms.

$$10. \overset{1}{5}x - \overset{0}{6}$$

$5x - 6$ Linear Binomial

$$11. \overset{1}{15}y - \overset{3}{84}y^3 + \overset{0}{100} - \overset{2}{3}y^2$$

$-84y^3 - 3y^2 + 15y + 100$ Cubic Polynomial

$$12. \overset{7}{7}a^3b^4 - \overset{4}{2}a^4 + \overset{1}{4}b - \overset{0}{15}$$

$7a^3b^4 - 2a^4 + 4b - 15$ Degree of 7 Polynomial

Today's Goal

I can

- add polynomials
- subtract polynomials
- simplify polynomials

Section 8.2a: Adding Polynomials

* Polynomial + Polynomial = Polynomial

Example:

$$(x^4 + 3x - 5) + (4x^4 - 2x + 11)$$

$$5x^4 + 1x + 6$$

Horizontal Method

Step 1: Rewrite with out parenthesis

Step 2: Identify like terms (use shapes to help see the common terms)

Step 3: Combine like terms

Step 4: Write answer in standard form

More Examples

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

Handwritten work showing the addition of the two polynomials with terms aligned and some terms circled or boxed. The result is $-x^4 + 3x^3 + 6x^2 - 6x$.

$$-x^4 + 3x^3 + 6x^2 - 6x$$

$$-x^4 + 3x^3 + 6x^2 - 6x$$

$$(3y^3 + 2x^2 - 7y + x + 14) + (-5x^3 + 8x^2 + 15y + 2)$$

$$3y^3 - 5x^3 + 10x^2 + 8y + x + 16$$

$$(16k^7 - 4k^3 - 10k + 21) + (8k^3 + k)$$

$$16k^7 + 4k^3 - 9k + 21$$

$$(4b^5 + 8b) + (3b^5 + 6b - 7b^5 + b - 3)$$

$$\cancel{4b^5} + \cancel{8b} + \cancel{3b^5} + \cancel{6b} - \cancel{7b^5} + \cancel{b} - 3$$

$$+4b^5 + 8b - 3$$

$$+3b^5 + 6b$$

$$-7b^5 + 1b$$

$$\cancel{0b^5} \quad \textcircled{15b - 3}$$

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

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

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

$$\textcircled{-9x + 8}$$

Vertical Method

Step #1: Rewrite the problem without parentheses

Step #2: Align like terms vertically (if a term does not have a like term use a 0 as a place holder)

Step #3: Add

Step 4: Write answer in standard form

Try these!!

1. $(-5m^5 + 6n - 21m) + (-10m + 15m^5 - 12n)$

2. $(-8m - 2) + (8m - 10)$

3. $(24xy + 3x - 21y + 3) + (13xy + 7y - 9x - 3)$

Try these!!

1. $(-5m^5 + 6n - 21m) + (-10m + 15m^5 - 12n)$

$$\underline{-5m^5 + 6n - 21m} \quad \underline{-10m + 15m^5 - 12n}$$

$$\underline{10m^5 - 31m - 6n}$$

2. $(-8m - 2) + (8m - 10)$

$$\underline{-8m - 2} + \underline{8m - 10}$$

$$\underline{-12}$$

3. $(24xy + 3x - 21y + 3) + (13xy + 7y - 9x - 3)$

$$\underline{24xy + 3x - 21y + 3} + \underline{13xy + 7y - 9x - 3}$$

$$\underline{37xy - 6x - 14y}$$

Section 8.2b: Subtracting Polynomials

* Polynomial - Polynomial = Polynomial

Example:

$$(3x^2 - 5x + 12) - (15x^2 - 7x + 9)$$

$$3x^2 - 5x + 12 - 15x^2 + 7x - 9$$

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

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

$$(7x^3 + 6x^2 - 2x) - (9x^2 - 4x + 3)$$

$$7x^3 + 6x^2 - 2x - 9x^2 + 4x - 3$$

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

Step 1: Rewrite the first polynomial without the parenthesis

Step 2: Distribute the negative to the second Polynomial

Step 3: Identify like terms (use shapes)

Step 4: Combine like terms

Step 5: Write the answer in standard form

More Examples:

$$(16k^7 - 4k^3 - 10k + 21) - (8k^3 + k)$$

$$\cancel{16k^7} - \cancel{4k^3} - \cancel{10k} + \cancel{21} - \cancel{8k^3} - \cancel{k}$$

$$16k^7 - 4k^3 - 10k + 21$$

$$- 8k^3 - 1k$$

$$16k^7 - 12k^3 - 11k + 21$$

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

$$-x^4 + 3x^3 - 6x^2 + 2x + 2$$



$$(3y^3 + 2x^2 - 7y + x + 14) - (-5x^3 + 8x^2 + 15y + 2)$$

Try these!!

1. $(-5m^5 - 6n - 21m) - (-10m + 15m^5 - 12n)$

2. $(-8m - 2) - (8m + 10)$

3. $(4xy + 3x - 2y + 3) - (-3xy + 7y - 9x - 3)$

Try these!!

1. $(-5m^5 - 6n - 21m) - (-10m + 15m^5 - 12n)$

$$-20m^5 + 6n - 11m$$

2. $(-8m - 2) - (8m + 10)$

$$-16m - 12$$

3. $(4xy + 3x - 2y + 3) - (-3xy + 7y - 9x - 3)$

$$7xy + 12x - 9y + 6$$

Homework

pg. 265 #24-36 (even)