Kuta Software - Infinite Algebra 1 Name_____

Adding and Subtracting Polynomials

Date_____ Period____

Simplify each expression.

1) $(5p^2 - 3) + (2p^2 - 3p^3)$

$-3p^3 + 7p^2 - 3$

2) $(a^3 - 2a^2) - (3a^2 - 4a^3)$

$5a^3 - 5a^2$

3) $(4 + 2n^3) + (5n^3 + 2)$

$7n^3 + 6$

4) $(4n - 3n^3) - (3n^3 + 4n)$

$-6n^3$

5) $(3a^2 + 1) - (4 + 2a^2)$

$a^2 - 3$

6) $(4r^3 + 3r^4) - (r^4 - 5r^3)$

$2r^4 + 9r^3$

7) $(5a + 4) - (5a + 3)$

1

8) $(3x^4 - 3x) - (3x - 3x^4)$

$6x^4 - 6x$

9) $(-4k^4 + 14 + 3k^2) + (-3k^4 - 14k^2 - 8)$

$-7k^4 - 11k^2 + 6$

10) $(3 - 6n^5 - 8n^4) - (-6n^4 - 3n - 8n^5)$

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

11) $(12a^5 - 6a - 10a^3) - (10a - 2a^5 - 14a^4)$

$14a^5 + 14a^4 - 10a^3 - 16a$

12) $(8n - 3n^4 + 10n^2) - (3n^2 + 11n^4 - 7)$

$-14n^4 + 7n^2 + 8n + 7$

13) $(-x^4 + 13x^5 + 6x^3) + (6x^3 + 5x^5 + 7x^4)$

$18x^5 + 6x^4 + 12x^3$

14) $(9r^3 + 5r^2 + 11r) + (-2r^3 + 9r - 8r^2)$

$7r^3 - 3r^2 + 20r$

15) $(13n^2 + 11n - 2n^4) + (-13n^2 - 3n - 6n^4)$

$-8n^4 + 8n$

16) $(-7x^5 + 14 - 2x) + (10x^4 + 7x + 5x^5)$

$-2x^5 + 10x^4 + 5x + 14$

17) $(7 - 13x^3 - 11x) - (2x^3 + 8 - 4x^5)$

$4x^5 - 15x^3 - 11x - 1$

18) $(13a^2 - 6a^5 - 2a) - (-10a^2 - 11a^5 + 9a)$

$5a^5 + 23a^2 - 11a$

19) $(3v^5 + 8v^3 - 10v^2) - (-12v^5 + 4v^3 + 14v^2)$

$15v^5 + 4v^3 - 24v^2$

20) $(8b^3 - 6 + 3b^4) - (b^4 - 7b^3 - 3)$

$2b^4 + 15b^3 - 3$

21) $(k^4 - 3 - 3k^3) + (-5k^4 + 6k^3 - 8k^5)$

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

22) $(-10k^2 + 7k + 6k^4) + (-14 - 4k^4 - 14k)$

$2k^4 - 10k^2 - 7k - 14$

23) $(-7n^2 + 8n - 4) - (-11n + 2 - 14n^2)$

$7n^2 + 19n - 6$

24) $(14p^4 + 11p^2 - 9p^5) - (-14 + 5p^5 - 11p^2)$

$-14p^5 + 14p^4 + 22p^2 + 14$

25) $(8k + k^2 - 6) - (-10k + 7 - 2k^2)$

$3k^2 + 18k - 13$

26) $(-9v^2 - 8u) + (-2uv - 2u^2 + v^2) + (-v^2 + 4uv)$

$-9v^2 + 2uv - 2u^2 - 8u$

27) $(4x^2 + 7x^3y^2) - (-6x^2 - 7x^3y^2 - 4x) - (10x + 9x^2)$

$14x^3y^2 + x^2 - 6x$

28) $(-5u^3v^4 + 9u) + (-5u^3v^4 - 8u + 8u^2v^2) + (-8u^4v^2 + 8u^3v^4)$

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

29) $(-9xy^3 - 9x^4y^3) + (3xy^3 + 7y^4 - 8x^4y^4) + (3x^4y^3 + 2xy^3)$

$-8x^4y^4 - 6x^4y^3 + 7y^4 - 4xy^3$

30) $(y^3 - 7x^4y^4) + (-10x^4y^3 + 6y^3 + 4x^4y^4) - (x^4y^3 + 6x^4y^4)$

$-9x^4y^4 - 11x^4y^3 + 7y^3$

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Multiplying Polynomials

Date_____ Period____

Find each product.

1) $6v(2v + 3)$

$12v^2 + 18v$

2) $7(-5v - 8)$

$-35v - 56$

3) $2x(-2x - 3)$

$-4x^2 - 6x$

4) $-4(v + 1)$

$-4v - 4$

5) $(2n + 2)(6n + 1)$

$12n^2 + 14n + 2$

6) $(4n + 1)(2n + 6)$

$8n^2 + 26n + 6$

7) $(x - 3)(6x - 2)$

$6x^2 - 20x + 6$

8) $(8p - 2)(6p + 2)$

$48p^2 + 4p - 4$

9) $(6p + 8)(5p - 8)$

$30p^2 - 8p - 64$

10) $(3m - 1)(8m + 7)$

$24m^2 + 13m - 7$

11) $(2a - 1)(8a - 5)$

$16a^2 - 18a + 5$

12) $(5n + 6)(5n - 5)$

$25n^2 + 5n - 30$

13) $(4p-1)^2$

$16p^2-8p+1$

14) $(7x-6)(5x+6)$

$35x^2+12x-36$

15) $(6n+3)(6n-4)$

$36n^2-6n-12$

16) $(8n+1)(6n-3)$

$48n^2-18n-3$

17) $(6k+5)(5k+5)$

$30k^2+55k+25$

18) $(3x-4)(4x+3)$

$12x^2-7x-12$

19) $(4a+2)(6a^2-a+2)$

$24a^3+8a^2+6a+4$

20) $(7k-3)(k^2-2k+7)$

$7k^3-17k^2+55k-21$

21) $(7r^2-6r-6)(2r-4)$

$14r^3-40r^2+12r+24$

22) $(n^2+6n-4)(2n-4)$

$2n^3+8n^2-32n+16$

23) $(6n^2-6n-5)(7n^2+6n-5)$

$42n^4-6n^3-101n^2+25$

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7-4 Study Guide and Intervention *(continued)*

Polynomials

Write Polynomials in Standard Form The terms of a polynomial are usually arranged so that the terms are in order from greatest degree to least degree. This is called the **standard form of a polynomial.**

Example **Write $-4x^3 + 9x^4 - 2x$ in standard form. Identify the leading coefficient.**

Step 1: Find the degree of each term.

Polynomial: $-4x^3 + 9x^4 - 2x$

Degree: $\downarrow$ 3, $\downarrow$ 4, $\downarrow$ 1

Step 2: Write the terms in descending order: $9x^4 - 4x^3 - 2x$.

The leading coefficient is 9.

Exercises

Write each polynomial in standard form. Identify the leading coefficient.

1. $5x + x^2 + 6$
   $x^2 + 5x + 6$; 1
2. $6x + 9 - 4x^2$
   $-4x^2 + 6x + 9$; -4
3. $x^4 + x^3 + x^2$
   $x^4 + x^3 + x^2$; 1
4. $2x^3 - x + 3x^7$
   $3x^7 + 2x^3 - 7$; 3
5. $2x + x^2 - 5$
   $x^2 + 2x - 5$; 1
6. $20x - 10x^2 + 5x^3$
   $5x^3 - 10x^2 + 20x$; 5
7. $x^3 + x^5 - x^2$
   $x^5 + x^3 - x^2$; 1
8. $x^4 + 4x^3 - 7x^5 + 1$
   $-7x^5 + x^4 + 4x^3 + 1$; -7
9. $-3x^6 - x^5 + 2x^8$
   $2x^8 - 3x^6 - x^5$; 2
10. $2x^7 - x^8$
    $-x^8 + 2x^7$; -1
11. $3x + 5x^4 - 2 - x^3$
    $5x^4 - x^3 + 3x - 2$; 5
12. $-2x^4 + x - 4x^6 + 3$
    $-4x^6 - 2x^4 + x + 3$; -4
13. $2 - x^{12}$
    $-x^{12} + 2$; -1
14. $5x^4 - 12x - 3x^6$
    $-3x^6 + 5x^4 - 12x$; -3
15. $9x^9 - 9 + 3x^3 - 6x^6$
    $9x^9 - 6x^6 + 3x^3 - 9$; 9

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7-4 Skills Practice

Polynomials

Determine whether each expression is a polynomial. If so, identify the polynomial as a *monomial*, *binomial*, or *trinomial*.

1. $5mt + t^2$
   yes; binomial
2. $4by + 2b - by$
   yes; binomial
3. -32
   yes; monomial
4. $\frac{3x}{7}$
   yes; monomial
5. $5x^2 - 3x^{-4}$
   no
6. $2c^2 + 8c + 9 - 3$
   yes; trinomial

Find the degree of each polynomial.

7. 12 0
8. $3r^4$ 4
9. $b + 6$ 1
10. $4a^8 - 2a$ 8
11. $5abc - 2b^2 + 1$ 3
12. $8x^5y^4 - 2x^8$ 9

Write each polynomial in standard form. Identify the leading coefficient.

13. $3x + 1 + 2x^2$
    $2x^2 + 3x + 1$; 3
14. $5x - 6 + 3x^2$
    $3x^2 + 5x - 6$; 3
15. $9x^2 + 2 + x^3 + x$
    $x^3 + 9x^2 + x + 2$; 1
16. $-3 + 3x^3 - x^2 + 4x$
    $3x^3 - x^2 + 4x - 3$; 3
17. $x^3 + 3x^2 + 27 - x$
    $3x^3 + x^2 - x + 27$; 3
18. $25 - x^3 + x$
    $-x^3 + x + 25$; -1
19. $x - 3x^2 + 4 + 5x^3$
    $5x^3 - 3x^2 + x + 4$; 5
20. $x^2 + 64 - x + 7x^3$
    $7x^3 + x^2 - x + 64$; 7
21. $6x^5 - 7x^5 + x - 2x^2 + 1$
    $-7x^5 + 6x^5 - 2x^2 + x + 1$; -7
22. $4 - x + 3x^3 - 2x^3$
    $3x^3 - 2x^2 - x + 4$; 3
23. $13 - 4x^9 + x^3$
    $-4x^9 + x^3 + 13$; -4
24. $17x^5 - 5x^{17} + 2$
    $-5x^{17} + 17x^5 + 2$; -5

Answers