

9.1 Polynomials in Standard Form

Answers

1. **Polynomial** - an expression made with constants, variables, and positive integer exponents of the variables.
2. **Monomial** - a one-termed polynomial.
3. **Degree** - The degree of a polynomial is named by identifying the largest exponent of a single term.
4. **Leading coefficient** - the first coefficient in the first term of a polynomial.
5. It is a polynomial because it has constants, variables and terms
6. It is a polynomial because it has constants, variables and terms
7. It is a monomial because it has constants, variables
8. It is a polynomial because it has constants, variables and terms
9. $2x - 3$, *degree of 1*
10. $19x^4 + 5x^2 - x - 10$, *degree of 4*
11. $3x^3 - 4x - 8$, *degree of 3*
12. $5f^8 - 7f^3 - 16$, *degree of 8*
13. $8x^3 - 5x^2 + 2x - 5$, *degree of 3*
14. $-9x^4 + x^2 + 12$, *degree of 4*

9.2 Addition and Subtraction of Polynomials

Answers

1. $-2x + 3$

2. $8r^4 + 3r^3 - 1r^2 + 9r$

3. $-x^2 + 11x - 12$

4. $7a^2b - 2a - 4b + 14$

5. $6.9a^2 - 4.8b^2 + 3.1a + b + 2ab$

6. $-10t^2 - 3t + 9$

7. $-6y^2 + 2y - 12$

8. $-h^7 + 5h^5 - 7h^3 + 7h^2 - 9h + 3$

9. $-8m^2 - 5m + 5$

10. $-2a^2b - 3ab^2 + 3a^2b^2 + 5b^2$

11. $2zx + yx$

12. $4ab + c^2$

13. $2xy - 2x^2$

14. $2ab + ab = 3ab$

9.3 Multiplication of Monomials by Polynomials

Answers

1. $-14x^2$

2. $-24a$

3. $60a^5b^4$

4. $-25xy$

5. xy^5

6. $45x^3y^3z^5$

7. $x^9y^3 + 3x^9$

8. $8x^2 - 10x$

9. $-60a^3b^4 + 6abc^5$

10. $27x^5 - 18x^4 + 63x^3$

11. $-27a^4b + 12a^2b^3$

9.4 Multiplication of Polynomials by Binomials

Answers

1. $x^2 + x - 6$

2. $2a^3 - 2a^2 - 12a$

3. $-8x^5y^2z^3 + 4xy^5z^9$

4. $x^2 - x - 6$

5. $3a^4 + 2a^2 - 8$

6. $63x^2 - 53x + 10$

7. $4x^3 - 4x^2 + 7x - 3$

8. $27x^3 + 8$

9. $a^4 - a^3 - 5a^2 + 17a - 12$

10. $3m^3 + 4m^2 - 59m - 20$

11. $2x^2 + 14x + 20$

12. $3x^2 + 8x$

13. $6x^3 + 14x^2 + 8x$

14. $24x^3 + 40x^2 - 16x$

9.5 Special Products of Polynomials

Answers

Square of a Binomial - $(a + b)^2 = a^2 + 2ab + b^2$, and $(a - b)^2 = a^2 - 2ab + b^2$

Sum and Difference Formula - $(a + b)(a - b) = a^2 - b^2$

1. $x^2 + 18x + 81$

2. $x^2 - 2x + 1$

3. $4y^2 + 24y + 36$

4. $9x^2 - 42x + 49$

5. $49c^2 + 112c + 64$

6. $81a^4 + 108a^2 + 36$

7. $b^4 - 2b^2 + 1$

8. $m^6 + 8m^3 + 16$

9. $\frac{1}{16}t^2 + t + 4$

10. $36k^2 - 36k + 9$

11. $a^6 - 14a^3 + 49$

12. $16x^4 + 8x^2y^2 + y^4$

13. $64x^2 - 48x + 9$

14. $4x^2 - 1$

15. $4x^2 - 9$

16. $16 - 36x^2$

17. $36 - 4r^2$

18. $49 - 4t^2$

19. $64z^2 - 64$

20. $9x^4 - 4$

21. $x^2 - 144$

22. $25a^2 - 4b^2$

23. $a^2b^2 - 1$

24. $a^2 - 2ab + b^2$

25. 2475

26. 8051

27. 361

28. 3136

29. 721,824

30. 999,996

31. 1584

9.6 Monomial Factors of Polynomials

Answers

1. $-3a^2(2a^5 - 3a - 12)$ or $3a^2(-2a^5 + 3a + 12)$

2. $y(x^3y + 12x + 16)$

3. $3x(x^2 - 7)$

4. $5x6(x^2 + 3)$

5. $2x(2x^2 + 5x - 1)$ or $-2x(-2x^2 - 5x + 1)$

6. $-2x^4(5x^2 - 6x + 2)$ or $2x^4(-5x^2 + 6x - 2)$

7. $12xy(1 + 2y + 3y^2)$

8. $a(5a^2 - 7)$

9. $15y^{10}(3y^2 + 2)$

10. $4xy(4yz + x^2)$

9.7 Zero Product Principle

Answers

1. The only way a product is zero is if one or both of the terms are zero.
2. Because they are not set equal to zero.
3. They are a sum, not a product
4. The first factor is a fraction that cannot be set equal to zero.
5. They are a difference, not a product.
6. It is not completely factored.
7. 0, 12
8. $-\frac{3}{2}, +\frac{4}{5}$
9. $-\frac{1}{2}, +\frac{1}{2}$
10. 0, $\frac{1}{6}$
11. 0, $\frac{4}{3}$
12. 5, $-\frac{7}{2}, \frac{4}{3}$

13. 0, -9, $\frac{20}{7}$

14. 0, 6

15. 0, 3

16. 0, $-\frac{1}{4}$

9.8 Factorization of Quadratic Expressions

Answers

1. $(9 + x)(1 + x)$

2. $(10 + x)(5 + x)$

3. $(7 + x)(3 + x)$

4. $(12 + x)(4 + x)$

5. $(3 + -1x)(8 + -1x)$

6. $(6 + -1x)(7 + -1x)$

7. $(3 + -1x)(11 + -1x)$

8. $(4 + -1x)(5 + -1x)$

9. $(-7 + -1x)(2 + -1x)$

10. $(-9 + -1x)(3 + -1x)$

11. $(-13 + -1x)(6 + -1x)$

12. $(-8 + -1x)(4 + -1x)$

13. $(-3 + -1x)(15 + -1x)$

14. $(-5 + -1x)(10 + -1x)$

15. $(-5 + -1x)(8 + -1x)$

16. $(-7 + -1x)(8 + -1x)$

17. $-1(1 + x)(1 + x)$

18. $(3 + -1x)(8 + x)$

19. $(-12 + x)(6 + -1x)$

20. $(-15 + x)(10 + -1x)$

21. $(12 + x)(9 + x)$

22. $(-6 + x)(5 + -1x)$

23. $(-16 + -1x)(4 + -1x)$

24. $(-3 + -1x)(20 + -1x)$

9.9 Factor Polynomials Using Special Products

Answers

1. $(4 + x)^2$

2. $(9 + -1x)^2$

3. $(12 + -1x)^2$

4. $(7 + x)^2$

5. $(1 + -2x)^2$

6. $(6 + 5x)^2$

7. $(2x + -3y)^2$

8. $(11 + 2x)^2$

9. $(2 + x)(-2 + x)$

10. $(6 + x)(-6 + x)$

11. $(10 + x)(10 + -1x)$

12. $(20 + x)(-20 + x)$

13. $(2 + 3x)(-2 + 3x)$

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

15. $(5 + 6x)(5 + -6x)$

16. $(4x + 9y)(4x + -9y)$

17. $x = 5, 6$

18. $x = -7, 3$

19. $x = 7$

20. $x = -8, 8$

21. $x = 12$

22. $x = -\frac{5}{2}, \frac{5}{2}$

23. $x = -13$

24. $x = -10, -6$

9.10 Factoring by Grouping

Answers

1. $(-2x + 3)(-3x - 5)$

2. $(-5x - 1)(-1x + 7)$

3. $(-1x + 1)(-9x + 1)$

4. $(-1x - 8)(-4x + 5)$

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

6. $(-1x - 7)(-4x + 3)$

7. $(3b + 4)(8b^2 - 1)$

8. $(2m + 3)(m^2 + 2)$

9. $(6x + 1)(x + 1)$

10. $(-2x + 1)(-2x - 5)$

11. $(5a^2 + 7)(a - 1)$

12. $(3x + 7)(x + 3)$

13. $(4x + 20)(y + 8)$

14. $(10a + 6)(b + 4)$

15. $3m(3n + 4)^2$

16. $(4j + 5)(k - 2j)$

17. $(8a - 7)(3b + 8)$

9.11 Factoring Completely

Answers

1. $2(5 + x)(3 + x)$

2. $3(5 + 2c)(-5 + 2c)$

3. $x(-10 + x)(7 + -1x)$

4. $6(10 + x)(-10 + x)$

5. $-5(2 + t)(2 + t)$

6. $6(-4 + -1x)(1 + -1x)$

7. $(-7 + n)(3 + -1n)$

8. $2(-1 + -1a)(8 + -1a)$

9. $2(16 + x)(-16 + x)$

10. $3x(1 + 2x)(1 + 2x)$

11. *Side 1 = 5(x), side two = 12(x + 7)*

12. *Side 1 = 15, Side 2 = 12*

13. *The number is 8*14. *The picture is 2ft x 2ft*

9.12 Probability of Compound Events

Answers

1. Independent events are occurrences where the outcome of the second event is not affected by the outcome of the first event.
2. Independent
3. Dependent
4. Independent
5. Independent
6. $\frac{1}{36}$
7. *Mutually Exclusive* is when two events cannot happen at the same time.
8. Mutually Exclusive
9. Not Mutually Exclusive
10. Not Mutually Exclusive
11. Mutually Exclusive
12. Not Mutually Exclusive

13. Mutually Exclusive

14. a. $\frac{2}{17}$
b. $\frac{1}{289}$
c. $\frac{25}{102}$
d. $\frac{14}{221}$
e. $\frac{55}{221}$
f. $\frac{1}{663}$

15. $\frac{10}{39}$

16. $\frac{4}{1001}$

17. $\frac{1}{26}$