

Polynomials

Operations with Polynomials

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14.2.1 Adding Polynomials

Add.

1. $(5x^2y - 4xy + 3) + (7xy - 3x^2y)$

2. $(5g - 9) + (7g^2 - 4g + 8)$

3. $(6bc - 2b^2c^2 + 8bc^2) + (6bc - 3bc^2)$

4. $(9h^4 + 5h - 4h^6) + (h^6 - 6h + 3h^4)$

5. $(4pq - 5p^2q + 9pq^2) + (6p^2q - 11pq^2) + (2pq^2 - 7pq + 6p^2q)$

6. $(8t^2 + 4t + 3) + (5t^2 - 8t + 9)$

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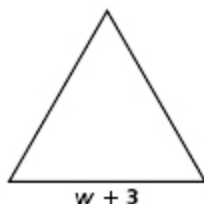
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7. $(5b^3c^2 - 3b^2c + 2bc) + (8b^3c^2 - 3bc + 14) + (b^2c - 5bc - 9)$

8. $(w^2 - 3w + 5) + (-2w - 3w^2 - 1) + (w^2 + w - 6)$

9. Each side of an equilateral triangle has length $w + 3$. Each side of a square has length $4w - 2$. Write an expression for the sum of the perimeter of the equilateral triangle and the perimeter of the square.



14.2.2 Subtracting Polynomials

Find the opposite of each polynomial.

10. $-4rn^2$

11. $3v - 5v^2$

12. $4m^2 - 6m + 2$

13. $4xy^2 + 2xy$

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14. $-8n^6 + 5n^3 - n$

15. $-9b^2 - 2b - 9$

Subtract.

16. $(6w^2 + 3w + 6) - (3w^2 + 4w - 5)$

17. $(14a + a^2) - (8 + a^2 + 9a)$

18. $(7r^2s^2 - 5rs^2 + 6r^2s + 7rs) - (3rs^2 - 3r^2s + 8rs)$

19. $(4x^2 + 6x - 1) - (3x^2 + 9x - 5)$

20. $(3a^2b^2 - 4ab - 2a - 4) - (4a^2b^2 + 5a - 3b + 6)$

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21. $(4pt^2 - 6p^3 + 5p^2t^2) - (5p^2 - 6pt^2 + 7p^2t^2)$

22. The current in an electrical circuit at t seconds is $4t^3 - 5t^2 + 2t + 200$ amperes. The current in another electrical circuit is $3t^3 - 2t^2 + 5t + 100$ amperes. Write an expression to show the difference in the two currents.

14.2.3 Multiplying Polynomials by Monomials

Multiply.

23. $(6x^2y^5)(-3xy^4)$

24. $(-gh^3)(-2g^2h^5)$

25. $(4a^2b)(2b^3)$

26. $(-s^4t^3)(2st)$

27. $12x^9y^7\left(\frac{1}{2}x^3y\right)$

28. $2.5j^3(3h^5j^7)$

29. $(3m^3n^4)(1 - 5mn^5)$

30. $3z(5z^2 - 4z)$

31. $-3h^2(6h + 3h^3)$

32. $-3cd(2c^3d^2 - 4cd^2)$

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33. $-2b(4b^4 - 7b + 10)$

34. $-3s^2t^2(4s^2t + 5st - 2s^2t^2)$

35. A rectangle has a base of length $3x^2y$ and a height of $2x^3 - 4xy - 3$. Write and simplify an expression for the area of the rectangle. Then find the area of the rectangle if $x = 2$ and $y = 1$.

14.2.4 Multiplying Binomials

Multiply.

36. $(x + 4)(x - 3)$

37. $(v - 1)(v + 5)$

38. $(w + 6)(w + 2)$

39. $(3x - 5)(x + 6)$

40. $(4m - 1)(3m + 2)$

41. $(3b - c)(4b + 5c)$

42. $(3t - 1)(t + 1)$

43. $(3r + s)(4r - 5s)$

44. $(5n - 3b)(n + 2b)$

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45. **Construction** The Gonzalez family is having a pool to swim laps built in their backyard. The pool will be 25 yards long by 5 yards wide. There will be a cement deck of width x yards around the pool. Find the total area of the pool and the deck.

Multiply.

46. $(x - 5)^2$

47. $(b + 3)^2$

48. $(x - 4)(x + 4)$

49. $(2x + 3)(2x - 3)$

50. $(4x - 1)^2$

51. $(a + 7)^2$