

Name _____ Date _____

Controlling the Population

Adding and Subtracting Polynomials

Vocabulary

Match each definition with its corresponding term.

- | | |
|---------------------------|--|
| 1. polynomial | a. a polynomial with only 1 term |
| 2. term | b. the degree of the term with the greatest exponent |
| 3. coefficient | c. a mathematical expression involving the sum of powers in one or more variables multiplied by coefficients |
| 4. monomial | d. a polynomial with exactly 3 terms |
| 5. binomial | e. any number being multiplied by a power within a polynomial expression |
| 6. trinomial | f. each product in a polynomial expression |
| 7. degree of a term | g. a polynomial with exactly 2 terms |
| 8. degree of a polynomial | h. the exponent of a term in a polynomial |

Problem Set

Identify the terms and coefficients in each expression.

1. $5x + 8$

The terms are $5x$ and 8 . The coefficients are 5 and 8 .

2. $2m^3$

3. $x^2 - 4x$

4. $-3w^4 + w^2 - 9$

5. -18

6. $10 - 3x^3 - 6x$

Determine whether each expression is a polynomial. If the expression is not a polynomial, explain why it is not.

7. $9 + 12x$

The expression is a polynomial.

8. $6m^{\frac{1}{2}}$

9. $\frac{3}{x} - 8x$

10. $-2w^3 + w^2 - 5$

12

11. $-2.5m$

12. $\frac{x}{7} + 10$

13. $x^3 + 12$

14. $\frac{4}{5}m - \frac{1}{5}$

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Determine whether each polynomial is a monomial, binomial, or trinomial. State the degree of the polynomial.

15. $8x + 3$

The polynomial is a binomial with a degree of 1.

16. $5m^2$

17. $x^2 - 7x$

18. $-9n^4 + 6n^2 - 1$

19. -12

20. $4 - 10x^3 + 8x$

Write each polynomial in standard form. Classify the polynomial by its number of terms and by its degree.

21. $2x + 6x^2$

$6x^2 + 2x$

The polynomial is a binomial with a degree of 2.

22. $-9m^2 + 4m^3$

23. $10 - 5x$

24. $7x - 3 + 12x^2$

25. $15 + 4w - w^3$

26. $5x^2 - 15 + 20x$

27. $-1 - p^4$

28. $-6t^2 + 4t + 3t^3$

29. $-18a^3 + 54a - 22a^2$

30. $x^3 - x^2 - x^5$

Simplify each expression.

31. $(5x - 8) + (7x + 10)$

$5x - 8 + 7x + 10$

$(5x + 7x) + (-8 + 10)$

$12x + 2$

32. $(4m^2 + 9m) - (2m^2 + 6)$

33. $(-x^2 + 5x - 12) + (2x^2 - 6)$

34. $(10t^2 - 3t + 9) - (6t^2 - 7t)$

35. $(-5w^2 + 3w - 8) + (15w^2 - 4w + 11)$

36. $(3x^3 + 10x - 1) - (5x^2 + 10x - 9)$

12

37. $(-a^2 + 2a - 8) + (2a^2 - 9a + 15)$

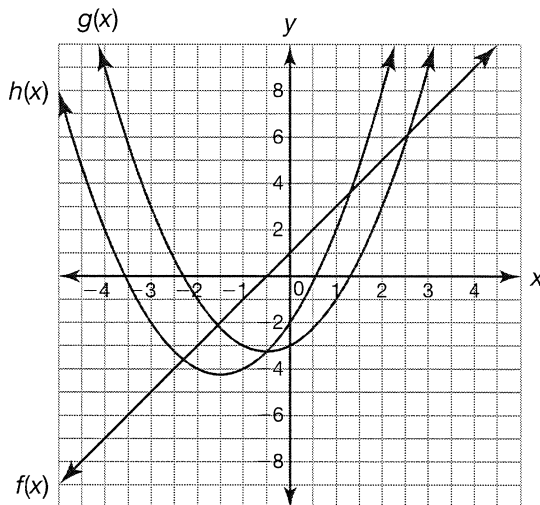
38. $(14p^4 + 7p^2) + (8p^3 + 7p^2 - p)$

39. $(3x^4 + 3x^2 - 3) - (6x^5 - 9x^3 + 2)$

40. $(-7m^3 - m^2 - m) - (-10m^3 - m - 1)$

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The graphs of the functions $f(x) = 2x + 1$, $g(x) = x^2 + x - 3$, and $h(x) = f(x) + g(x)$ are shown. Evaluate the function $h(x)$ for each given value of x . Use the graph of $h(x)$ to verify your answer.



41. Evaluate $h(x)$ at $x = 2$.

$$\begin{aligned} h(x) &= f(x) + g(x) \\ &= 2x + 1 + x^2 + x - 3 \\ &= x^2 + 3x - 2 \\ h(2) &= (2)^2 + 3(2) - 2 \\ &= 4 + 6 - 2 \\ &= 8 \end{aligned}$$

42. Evaluate $h(x)$ at $x = -4$.

43. Evaluate $h(x)$ at $x = 0$.

44. Evaluate $h(x)$ at $x = 1$.

45. Evaluate $h(x)$ at $x = -2$.

46. Evaluate $h(x)$ at $x = -1.5$.