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Lesson 5 Reteach

Simplify Algebraic Expressions

When a plus or minus sign separates an algebraic expression into parts, each part is called a **term**. The numerical factor of a term that contains a variable is called the coefficient of the variable. A term without a variable is called a **constant**. **Like terms** contain the same variables to the same powers, such as $3x^2$ and $2x^2$.

Example

1 Identify the terms, like terms, coefficients, and constants in the expression $7x - 5 + x - 3x$.

$7x - 5 + x - 3x = 7x + (-5) + x + (-3x)$ Definition of subtraction
$= 7x + (-5) + 1x + (-3x)$ Identity Property; $x = 1x$

The terms are $7x$, -5, x, and $-3x$. The like terms are $7x$, x, and $-3x$. The coefficients are 7, 1, and -3. The constant is -5.

An algebraic expression is in **simplest form** if it has no like terms and no parentheses.

Examples

Write each expression in simplest form.

2 $5x + 3x$

$5x + 3x = (5 + 3)x$ or $8x$ Distributive Property; simplify.

3 $-2m + 5 + 6m - 3$

$-2m$ and $6m$ are like terms. 5 and -3 are also like terms.

$-2m + 5 + 6m - 3 = -2m + 5 + 6m + (-3)$ Definition of subtraction
$= -2m + 6m + 5 + (-3)$ Commutative Property
$= (-2 + 6)m + 5 + (-3)$ Distributive Property
$= 4m + 2$ Simplify.

Exercises

Identify the terms, like terms, coefficients, and constants in each expression.

1. $-4y - 3 + 2y$
terms: $-4y$, -3, $2y$; like terms: $-4y$, $2y$; coefficients: -4, 2; constant: -3

2. $-5g + 3 + 2g - g$
terms: $-5g$, 3, $2g$, $-g$; like terms: $-5g$, $2g$, $-g$; coefficients: -5, 2, -1; constant: 3

3. $5 + 3a - 4 - a$
terms: 5, $3a$, -4, $-a$; like terms: $3a$, $-a$; 5, -4; coefficients: 3, -1; constants: 5, -4

Write each expression in simplest form.

4. $3d + 6d$ **$9d$**

5. $2 + 5s - 4$ **$5s - 2$**

6. $2z + 3 - 9z - 8$ **$-7z - 5$**

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Lesson 5 Skills Practice

Simplify Algebraic Expressions

Identify the terms, like terms, coefficients, and constants in each expression.

1. $4e + 7e + 5$

terms: 4*e*, 7*e*, 5; like terms: 4*e*, 7*e*; coefficients: 4, 7; constant: 5

2. $5a + 2 - 7$

terms: 5*a*, 2, −7; like terms: 2, −7; coefficient: 5; constants: 2, −7

3. $-3h - 2h + 6h + 9$

terms: −3*h*, −2*h*, 6*h*, 9; like terms: −3*h*, −2*h*, 6*h*; coefficients: −3, −2, 6; constant: 9

4. $4 - 4y + y - 3$

terms: 4, −4*y*, *y*, −3; like terms: −4*y*, *y*; 4, −3; coefficients: −4, 1; constants: 4, −3

5. $7 - 5y + 2 + 1$

terms: 7, −5*y*, 2, 1; like terms: 7, 2, 1; coefficient: −5; constants: 7, 2, 1

6. $2m + 3m - m$

terms: 2*m*, 3*m*, −*m*; like terms: 2*m*, 3*m*, −*m*; coefficients: 2, 3, −1; constants: none

7. $9k + 7 - k + 4$

terms: 9*k*, 7, −*k*, 4; like terms: 9*k*, −*k*; 7, 4; coefficients: 9, −1; constants: 7, 4

8. $-8p + 6p - 2$

terms: −8*p*, 6*p*, −2; like terms: −8*p*, 6*p*; coefficients: −8, 6; constant: −2

Write each expression in simplest form.

9. $3t + 6t$ **9*t***

10. $4r + r$ **5*r***

11. $7f - 2f$ **5*f***

12. $9a - 8a$ ***a***

13. $5c + 8c$ **13*c***

14. $2g - 5g$ **−3*g***

15. $8k + 3 + 4k$ **12*k* + 3**

16. $7m - 5m - 6$ **2*m* − 6**

17. $9 - 6x + 5$ **−6*x* + 14**

18. $7p - 1 - 9p + 5$ **−2*p* + 4**

19. $-b - 3b + 8b + 4$ **4*b* + 4**

20. $5h - 6 - 8 + 7h$ **12*h* − 14**

21. $8b + 6 - 8b + 1$ **7**

22. $t - 5 - 2t + 5$ **−*t***

23. $4w + 5w + w$ **10*w***

24. $6m - 7 + 2m + 7$ **8*m***

25. $5f - 7f + f$ **−*f***

26. $12y - 8 + 4y + y$ **17*y* − 8**

Write an expression in simplest form that represents the total amount in each situation.

27. **RUNNING** You run m miles on Friday, the same amount on Saturday, and 4 miles on Sunday. **2*m* + 4**

28. **READING** Hendrick read b books in January, twice that amount in February, and 1 book in March. **3*b* + 1**