Enrich

Extended Simplifying Algebraic Expressions

Like Terms are groups of terms which contain the same variables, such as 3x and x or 2y and 8y. In extended algebraic expressions, there are often multiple sets of like terms. When solving these problems, first isolate the like terms and then combine them together..

Simplify the algebraic expression. Justify your steps.

4x + 5y + 3 + 8y + 7x + 2x + 15 + y + 8

| = 4x + 5y + 3 + 8y + 9x + 15 + y + 8 | Combine like terms. |
|--------------------------------------|----------------------|
| = 4x + 5y + 8y + 3 + 9x + 15 + y + 8 | Commutative Property |
| = 4x + 13y + 3 + 9x + 15 + y + 8 | Combine like terms. |
| = 4x + 13y + 3 + 15 + 9x + y + 8 | Commutative Property |
| = 4x + 13y + 18 + 9x + y + 8 | Add. |
| = 4x + 13y + 9x + 18 + y + 8 | Commutative Property |
| = 4x + 13y + 9x + y + 18 + 8 | Commutative Property |
| = 4x + 13y + 9x + y + 26 | Add. |
| = 4x + 9x + 13y + y + 26 | Commutative Property |
| = 13x + 13y + y + 26 | Combine like terms. |
| = 13x + 14y + 26 | Combine like terms. |

Simplify the following expressions. Justify your steps.

1. 2(x + 4) + 3(y + x) + 17 + x + 4y**2.** (3 + 2x) + x + y + (15 + 6y) + 24 + 8z