Looking Ahead

Simplifying algebraic expressions is a common step when solving systems of linear equations.

Example Preview

Solve the system of linear equations algebraically.

$$\begin{aligned} y &= 2x + 4 \\ x + 2y &= 18 \end{aligned}$$

Step 1: Solve one of the equations for one of the variables.

Since the first equation is already solved for y, we can move on to the next step.

Step 2: Substitute the expression found in Step 1 into the other equation and solve for the remaining variable.

Use the expression $2x + 4$ as a substitution for y in the second equation.

$$\begin{aligned} x + 2y &= 18 \\ x + 2(2x + 4) &= 18 \\ x + 4x + 8 &= 18 \\ 5x + 8 &= 18 \\ 5x &= 10 \\ x &= 2 \end{aligned}$$

Step 3: Substitute the value found in Step 2 into the original equation from Step 1 and solve for the remaining variable.

Using the original equation from Step 1, find the y-coordinate by substituting $x = 2$ into the equation.

$$\begin{aligned} y &= 2x + 4 \\ &= 2(2) + 4 \\ &= 4 + 6 = 10 \end{aligned}$$

Thus, our point of intersection for the two lines is (2, 10).

5.R.2 Exercises

Concept Check

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

1. A variable that does not appear to have an exponent has an exponent of 1.

2. In the term $-9x$, nine is being subtracted from x.

3. In the term "$12a$," 12 is the constant.

4. Like terms have the same coefficients.

Practice

Identify the like terms in the list of terms.

5. $-5, 3, 7x, 8, 9x, 3y$

Simplify each expression by combining like terms.

6. $2a + 14a - 25a$

7. $5x^2 - 3x^2 + 2x$

8. $3(n+1) + n$

Writing & Thinking

9. Discuss like and unlike terms and give an example of each.

10. Explain the difference between -13^2 and $(-13)^2$.