



Simplifying Linear Expressions

Grade 7 Linear Equation Worksheet

Date: _____

Name: _____

LET'S MAKE SIMPLIFYING LINEAR EXPRESSIONS EASY

Simplify the following

1. $15y + 3 - y =$
2. $6(b - 6) =$
3. $9p - 3v - (8v + 2p) =$
4. $16 + 9a - (4 + 3a) =$
5. $7c + 10 - c =$
6. $8(5p - 3) - 4 =$
7. $h - (5y + h) =$
8. $-2c + (8c - 7) =$

Complete the following problems

9. Write an equivalent expressions for $9a + 45$.
10. Write an equivalent expressions for $6a + 24$.
11. Write an equivalent expression for $8(x + 2) - 14$.
12. Write an equivalent expression for $(c + 6) - 2 + 9$.
13. Write an equivalent expression for $5(x + 3) - 7$.
14. An squared whiteboard has a perimeter of $(4x + 24)$. What is the length of each side of the whiteboard?
15. $9(3a - 2) + 18a$ and $9(5a - 2)$ are equivalent? Is it correct? Explain why or why not?



Simplifying Linear Expressions

Answers

1. $14y + 3$
2. $6b - 36$
3. $7p - 11v$
4. $6(a + 2)$
5. $6c + 10$
6. $40p - 28$
7. $-5y$
8. $6c - 7$
9. $9(a + 5)$
10. $6(a + 4)$
11. $8x + 2$
12. $c + 13$
13. $5x + 8$
14. The length of each of the four sides is $(x + 6)$.
15. The second expression is: $9(5a^2)$.
The first expression is equivalent to the second expression. Yes, it is correct.

Answer Explanation

- $14y + 3$
- $6b - 36$
- $9p - 3v - (8v + 2p)$ (parenthesis)
 $= 9p - 3v - 8v - 2p$ (combine like terms)
 $= 9p - 2p - 3v - 8v$
 $= 7p - 11v$
- $16 - 9a - (4 + 3a)$ (parenthesis)
 $= 16 - 9a - 4 + 3a$ (combine like terms)
 $= 16 - 4 - 9a + 3a = 12 - 6a$
- $7c + 10 - c$ (parenthesis)
 $= 7c - c + 10$ (combine like terms)
 $= 6c + 10$
- $8(5p - 3) - 4$ (parenthesis)
 $= 40p - 24 - 4$ (combine like terms)
 $= 40p - 28$
- $h - (5y + h)$ (parenthesis)
 $= h - 5y - h$ (combine like terms)
 $= 5y$
- $-2c + (8c - 7)$ (parenthesis)
 $= -2c + 8c - 7$ (combine like terms)
 $= 6c - 7$
- Write it in factorized form.
Find the GCF.
Which is 9.
Place that outside the parenthesis.
And you get an answer of:
 $9(a + 5)$
- Write it in factorized form.
Find the GCF.
Which is 6.
Place that outside the parenthesis.
And you get an answer of:
 $6(a + 4)$
- We have to find an equivalent equation. If we work the equation out, we will generate an equal expression:

$$\begin{aligned}
& 8(x + 2) - 14 \text{ (parenthesis)} \\
& = 8x + 16 - 14 \text{ (combine like terms)} \\
& = 8x + 2
\end{aligned}$$

12. We have to find an equivalent equation. If we work the equation out, we will generate an equal expression:

$$\begin{aligned}
& (c + 6) - 2 + 9 \text{ (parenthesis)} \\
& = c + 6 - 2 + 9 \text{ (combine like terms)} \\
& = c + 6 + 9 - 2 \text{ (order of operation)} \\
& = c + 13
\end{aligned}$$

13. We have to find an equivalent equation. If we work the equation out, we will generate an equal expression:

$$\begin{aligned}
& 5(x + 3) - 7 \text{ (parenthesis)} \\
& = 5x + 15 - 7 \text{ (combine like terms)} \\
& = 5x + 8
\end{aligned}$$

14. **Step 1:** This looks very hard at first. We need to remember that in a square all four sides are equal. So it stands to reason that if we divide the perimeter by 4, we can determine the length of one side.

Step 2: Take 4 as common factor in $(4x + 24)$. The result will be $4(x + 6)$. $4(x + 6)$ is the perimeter of square whiteboard whose all four sides are equal.

Step 3: So divide $4(x + 6)$ by 4

The length of each of the four sides is $(x + 6)$.

15. Step 1) We will write each expression in its simplest form.

Step 2) Distribute and combine like terms in the first expression to get

$$\begin{aligned}
& 9(3a - 2) + 18a = 27a - 18 + 18a \text{ (combine like terms)} \\
& = 45a - 18 \text{ (take 9 as common factor)} \\
& = 9(5a - 2)
\end{aligned}$$

The second expression is: $9(5a - 2)$.

The first expression is equivalent to the second expression. Yes, it is correct.