

Simplify each side of the equation and tell if the statement is true or not.

1. $9 + 6 = 6 + 9$

$$15 = 15$$

True

2. $21 \div 7 = 7 \div 21$

$$3 = \frac{7}{21}$$

$$3 = \frac{1}{3}$$

False

3. $10 - 4 = 4 - 10$

$$6 = -6$$

False

4. $(5 + 3) + 8 = 5 + (3 + 8)$

$$16 = 16$$

True

5. $(9 - 4) - 2 = 9 - (4 - 2)$

$$5 - 2 = 9 - 2$$

$$3 = 7$$

False

Rewrite each expression using the Commutative Property.

6. $5X + 4$

$$5X + 4 = 4 + 5X$$

9. 15×40

$$15 \times 40 = 40 \times 15$$

7. 9×6

$$9 \times 6 = 6 \times 9$$

10. $A + BC$

$$A + BC = BC + A$$

8. $3Y + 2X$

$$3Y + 2X = 2X + 3Y$$

Rewrite each expression using the Associative Property.

11. $(X + 10) + 12$

$$(X + 10) + 12 = X + (10 + 12)$$

14. $(T \times 7) \times 9$

$$(T \times 7) \times 9 = T \times (7 \times 9)$$

12. $7 \times (2 \times 9)$

$$7 \times (2 \times 9) = (7 \times 2) \times 9$$

15. $X + (9 + 8)$

$$X + (9 + 8) = (X + 9) + 8$$

13. $6B + (2B + 13B)$

$$6B + (2B + 13B) = (6B + 2B) + 13B$$

Use the Associative and Commutative Properties to simplify the expressions by combining like terms.

16. $5A + 2B - 2B - 2A - 3B$

$$\begin{aligned} &5A + 2B + (-2B) + (-2A) + (-3B) \\ &5A + (-2A) + 2B + (-2B) + (-3B) \\ &3A + (-3B) \\ &3A - 3B \end{aligned}$$

17. $9X + Y - 3X + 8Y$

$$\begin{aligned} &9X + Y + (-3X) + 8Y \\ &9X + (-3X) + Y + 8Y \\ &6X + 9Y \end{aligned}$$

18. $7Q + 4R - R + 2Q + 3Q - 5R$

$$\begin{aligned} &7Q + 4R + (-R) + 2Q + 3Q + (-5R) \\ &7Q + 2Q + 3Q + 4R + (-R) + (-5R) \\ &12Q + (-2R) \\ &12 - 2R \end{aligned}$$

19. $4Y - 2 + 3Y - 1 - 5Y$

$$\begin{aligned} &4Y + (-2) + 3Y + (-1) + (-5Y) \\ &4Y + 3Y + (-5Y) + (-2) + (-1) \\ &2Y + (-3) \\ &2Y - 3 \end{aligned}$$

20. $2X + 8 - X + 2$

$$\begin{aligned} &2X + 8 + (-X) + 2 \\ &2X + (-X) + 8 + 2 \\ &X + 10 \end{aligned}$$

21. $15A + 7 - 5B - 7B - 14A + 12$

$$\begin{aligned} &15A + 7 + (-5B) + (-7B) + (-14A) + 12 \\ &15A + (-14A) + (-5B) + (-7B) + 7 + 12 \\ &A + (-12B) + 19 \\ &A - 12B + 19 \end{aligned}$$

True or False

22. Addition is commutative.

True

23. Division is associative.

False

24. Subtraction is associative.

False

25. Multiplication is commutative.

True