

Rewrite each expression using the Distributive Property.

1. $10(X + Y) =$

$$\begin{aligned} 10(X + Y) &= (10)(X) + (10)(Y) \\ &= 10X + 10Y \end{aligned}$$

2. $7(2A - 3B) =$

$$\begin{aligned} 7(2A - 3B) &= (7)(2A) - (7)(3B) \\ &= 14A - 21B \end{aligned}$$

3. $X(5 + 9) =$

$$\begin{aligned} X(5 + 9) &= (X)(5) + (X)(9) \\ &= 5X + 9X \end{aligned}$$

4. $11(8 - Q) =$

$$\begin{aligned} 11(8 - Q) &= (11)(8) - (11)(Q) \\ &= 88 - 11Q \end{aligned}$$

5. $6(5Q - 2) =$

$$\begin{aligned} 6(5Q - 2) &= (6)(5Q) - (6)(2) \\ &= 30Q - 12 \end{aligned}$$

6. $2X(10 + 1) =$

$$\begin{aligned} 2X(10 + 1) &= (2X)(10) + (2X)(1) \\ &= 20X + 2X \end{aligned}$$

7. $Y(X + Z) =$

$$\begin{aligned} Y(X + Z) &= (Y)(X) + (Y)(Z) \\ &= YX + YZ \\ &= XY + YZ \end{aligned}$$

(Note: writing variables in alphabetical order will help you keep track of multiple variables in future Algebra courses.)

8. $A(3B - 2C) =$

$$\begin{aligned} A(3B - 2C) &= (A)(3B) - (A)(2C) \\ &= 3AB - 2AC \end{aligned}$$

Find the greatest common factor and rewrite.

9. $12Y + 30X =$

$$12Y + 30X = 6(2Y + 5X)$$

10. $24Q - 21X =$

$$24Q - 21X = 3(8Q - 7X)$$

11. $9Y + 9 =$

$$9Y + 9 = 9(Y + 1)$$

12. $8X - 11X =$

$$8X - 11X = X(8 - 11)$$

13. $12A + 2AB =$

$$12A + 2AB = 2A(6 + B)$$

14. $9XY + 36XZ =$

$$9XY + 36XZ = 9X(Y + 4Z)$$

15. $8X - 4 =$

$$8X - 4 = 4(2X - 1)$$

Demonstrate the Distributive Property and then simplify both sides of the equation using the order of operations.

16. $3(5 - 2) =$

$$\begin{aligned} 3(5 - 2) &= (3)(5) - (3)(2) \\ 3(3) &= 15 - 6 \\ 9 &= 9 \end{aligned}$$

17. $11(8 + 4) =$

$$\begin{aligned} 11(8 + 4) &= (11)(8) + (11)(4) \\ 11(12) &= 88 + 44 \\ 132 &= 132 \end{aligned}$$

18. $7(9 - 1) =$

$$\begin{aligned} 7(9 - 1) &= (7)(9) - (7)(1) \\ 7(8) &= 63 - 7 \\ 56 &= 56 \end{aligned}$$

19. $10(5 + 6) =$

$$\begin{aligned} 10(5 + 6) &= (10)(5) + (10)(6) \\ 10(11) &= 50 + 60 \\ 110 &= 110 \end{aligned}$$

20. $-3(4 + 8) =$

$$\begin{aligned} -3(4 + 8) &= (-3)(4) + (-3)(8) \\ -3(12) &= (-12) + (-24) \\ -36 &= -36 \end{aligned}$$

21. $-2(8 + 3) =$

$$\begin{aligned} -2(8 + 3) &= (-2)(8) + (-2)(3) \\ -2(11) &= (-16) + (-6) \\ -22 &= -22 \end{aligned}$$

22. $9(X + X) =$

$$\begin{aligned} 9(X + X) &= (9)(X) + (9)(X) \\ 9(2X) &= 9X + 9X \\ 18X &= 18X \end{aligned}$$

23. $A(4 + 2) =$

$$\begin{aligned} A(4 + 2) &= (A)(4) + (A)(2) \\ A(6) &= 4A + 2A \\ 6A &= 6A \end{aligned}$$

24. $Q(X - 7) =$

$$\begin{aligned} Q(X - 7) &= (Q)(X) - (Q)(7) \\ QX - 7Q &= QX - 7Q \end{aligned}$$

25. $-5(3 + 2) =$

$$\begin{aligned} -5(3 + 2) &= (-5)(3) + (-5)(2) \\ -5(5) &= (-15) + (-10) \\ -25 &= -25 \end{aligned}$$