Rewrite each expression using the Distributive Property.

1. $10(X + Y) =$

   $\mathbf{10(X + Y) = (10)(X) + (10)(Y)}$
   $\mathbf{= 10X + 10Y}$

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

   $\mathbf{7(2A - 3B) = (7)(2A) - (7)(3B)}$
   $\mathbf{= 14A - 21B}$

3. $X(5 + 9) =$

   $\mathbf{X(5 + 9) = (X)(5) + (X)(9)}$
   $\mathbf{= 5X + 9X}$

4. $11(8 - Q) =$

   $\mathbf{11(8 - Q) = (11)(8) - (11)(Q)}$
   $\mathbf{= 88 - 11Q}$

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

   $\mathbf{6(5Q - 2) = (6)(5Q) - (6)(2)}$
   $\mathbf{= 30Q - 12}$

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

   $\mathbf{2X(10 + 1) = (2X)(10) + (2X)(1)}$
   $\mathbf{= 20X + 2X}$

7. $Y(X + Z) =$

   $\mathbf{Y(X + Z) = (Y)(X) + (Y)(Z)}$
   $\mathbf{= YX + YZ}$
   $\mathbf{= XY + YZ}$

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

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

   $\mathbf{A(3B - 2C) = (A)(3B) - (A)(2C)}$
   $\mathbf{= 3AB - 2AC}$

Find the greatest common factor and rewrite.

9. $12Y + 30X =$

   $\mathbf{12Y + 30X = 6(2Y + 5X)}$

10. $24Q - 21X =$

    $\mathbf{24Q - 21X = 3(8Q - 7X)}$

11. $9Y + 9 =$

    $\mathbf{9Y + 9 = 9(Y + 1)}$

12. $8X - 11X =$

    $\mathbf{8X - 11X = X(8 - 11)}$

13. $12A + 2AB =$

    $\mathbf{12A + 2AB = 2A(6 + B)}$

14. $9XY + 36XZ =$

    $\mathbf{9XY + 36XZ = 9X(Y + 4Z)}$

15. $8X - 4 =$

    $\mathbf{8X - 4 = 4(2X - 1)}$

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

16. $3\,(5-2) =$

$$\mathbf{3\,(5-2) = (3)(5) - (3)(2)}$$
$$\mathbf{3(3) = 15 - 6}$$
$$\mathbf{9 = 9}$$

17. $11\,(8+4) =$

$$\mathbf{11\,(8+4) = (11)(8) + (11)(4)}$$
$$\mathbf{11(12) = 88 + 44}$$
$$\mathbf{132 = 132}$$

18. $7\,(9-1) =$

$$\mathbf{7\,(9-1) = (7)(9) - (7)(1)}$$
$$\mathbf{7(8) = 63 - 7}$$
$$\mathbf{56 = 56}$$

19. $10\,(5+6) =$

$$\mathbf{10\,(5+6) = (10)(5) + (10)(6)}$$
$$\mathbf{10(11) = 50 + 60}$$
$$\mathbf{110 = 110}$$

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

$$\mathbf{-3\,(4+8) = (-3)(4) + (-3)(8)}$$
$$\mathbf{-3(12) = (-12) + (-24)}$$
$$\mathbf{-36 = -36}$$

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

$$\mathbf{-2\,(8+3) = (-2)(8) + (-2)(3)}$$
$$\mathbf{-2(11) = (-16) + (-6)}$$
$$\mathbf{-22 = -22}$$

22. $9\,(X+X) =$

$$\mathbf{9\,(X+X) = (9)(X) + (9)(X)}$$
$$\mathbf{9(2X) = 9X + 9X}$$
$$\mathbf{18X = 18X}$$

23. $A\,(4+2) =$

$$\mathbf{A\,(4+2) = (A)(4) + (A)(2)}$$
$$\mathbf{A(6) = 4A + 2A}$$
$$\mathbf{6A = 6A}$$

24. $Q\,(X-7) =$

$$\mathbf{Q\,(X-7) = (Q)(X) - (Q)(7)}$$
$$\mathbf{QX - 7Q = QX - 7Q}$$

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

$$\mathbf{-5\,(3+2) = (-5)(3) + (-5)(2)}$$
$$\mathbf{-5(5) = (-15) + (-10)}$$
$$\mathbf{-25 = -25}$$