

The Distributive Property

To multiply a sum or difference by a number, multiply each number in the sum or difference by the number outside the parentheses, then evaluate.

Distributive Property	
With addition: $5(7 + 3) = 5(7) + 5(3)$	$a(b + c) = a(b) + a(c)$
With subtraction: $5(7 - 3) = 5(7) - 5(3)$	$a(b - c) = a(b) - a(c)$

Example 2 Simplify each expression.

a. $6(x + 9)$

$$6(x + 9) = 6(x) + 6(9)$$

$$= 6x + 54$$

b. $10(12 + z + 7)$

$$10(12 + z + 7) = 10(12) + 10(z) + 10(7)$$

$$= 120 + 10z + 70$$

$$= 10z + 190$$

c. $16(8w - 3)$

$$16(8w - 3) = 16(8w) - 16(3)$$

$$= 128w - 48$$

d. $5(4m - 3n - 1)$

$$5(4m - 3n - 1) = 5(4m) - 5(3n) - 5(1)$$

$$= 20m - 15n - 5$$

Practice

Check your answers at BigIdeasMath.com.

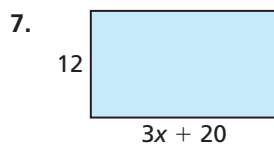
Evaluate.

1. $25(7 + 11)$ **450** 2. $4(13 - 5)$ **32** 3. $9(16 + 7 - 8)$ **135** 4. $-4(10 - 9 - 6)$ **20**

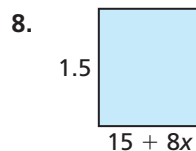
Simplify the expression.

5. $4(y + 7)$ **$4y + 28$** 6. $-2(z + 5)$ **$-2z - 10$** 7. $5(b - 11)$ **$5b - 55$** 8. $-8(d - 1)$ **$-8d + 8$**
9. $12(4a + 13)$ **$48a + 156$** 10. $9(20 + 17m)$ **$153m + 180$** 11. $11(2k - 11)$ **$22k - 121$** 12. $-7(-2n - 9)$ **$14n + 63$**
13. $3(x + 4 + 9)$ **$3x + 39$** 14. $6(25 + 6z + 10)$ **$36z + 210$** 15. $8(p - 6 - 5)$ **$8p - 88$** 16. $-10(4 + v - 1)$ **$-10v - 30$**
17. $7(2x + 7 + 9y)$ **$14x + 63y + 49$** 18. $-4(4r - s + 17)$ **$-16r + 4s - 68$** 19. $-3(-12 - 3d - 8)$ **$9d + 60$** 20. $2 - 6(2n - 9)$ **$-12n + 56$**
21. $1.5(6c + 10d + 3)$ **$9c + 15d + 4.5$** 22. $\frac{3}{4}\left(q + \frac{1}{6} + \frac{7}{8}\right)$ **$\frac{3}{4}q + \frac{25}{32}$** 23. $-2.4(5h - 10 + 4)$ **$-12h + 14.4$** 24. $0.5(2.6x + 5.8)$ **$1.3x + 2.9$**

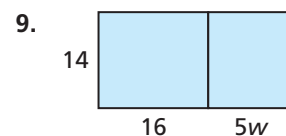
Write and simplify an expression for the area of the rectangle.



$36x + 240$



$12x + 22.5$



$70w + 224$