2-2 The Distributive Property

Objective: To use the distributive property to compute mentally and to simplify expressions.

Terms to Know

Distributive property The property that allows you to multiply each number inside a set of parentheses by a factor outside the parentheses.

In Arithmetic
$6(20 + 4) = 6(20) + 6(4)$
$6(20 - 4) = 6(20) - 6(4)$

In Algebra
$m(n + p) = mn + mp$
$m(n - p) = mn - mp$

CAUTION Remember that this property works *only* when multiplication is outside and addition or subtraction is inside the parentheses.

Example 1 Use the distributive property to find each answer mentally.

a. $6(14) + 6(16)$ b. $4(22) - 4(16)$

Solution

a. $6(14) + 6(16) = 6(14 + 16)$
$= 6(30)$
$= 180$

b. $4(22) - 4(16) = 4(22 - 16)$
$= 4(6)$
$= 24$

Use the distributive property to find each answer mentally.

1. $2(12) + 2(8)$ 2. $3(17) - 3(7)$ 3. $6(38) - 6(31)$

4. $4(22) - 4(17)$ 5. $7(6) + 7(4)$ 6. $8(23) + 8(7)$

7. $5(24) + 5(26)$ 8. $6(16) - 6(5)$ 9. $2(32) - 2(2)$

10. $7(78) - 7(75)$ 11. $4(21) + 4(29)$ 12. $9(15) + 9(25)$

Example 2 Use the distributive property to find each answer mentally.

a. $3(208)$ b. $7(199)$

Solution

a. $3(208) = 3(200 + 8)$
$= 3(200) + 3(8)$
$= 600 + 24$
$= 624$

b. $7(199) = 7(200 - 1)$
$= 7(200) - 7(1)$
$= 1400 - 7$
$= 1393$

Use the distributive property to find each answer mentally.

13. $6(102)$ 14. $3(191)$ 15. $2(389)$

16. $7(296)$ 17. $8(398)$ 18. $9(108)$

19. $4(203)$ 20. $6(297)$ 21. $5(192)$

22. $2(311)$ 23. $8(209)$ 24. $7(307)$

Study Guide, MATHEMATICAL CONNECTIONS