GemA

$(4+12)+(4+12)+(4+12)$

$16 + 16 + 16 = 48$

Alg 1 1.4 (Repeat from Tues.)

Use the distributive property to evaluate expressions

Use the distributive property to simplify expressions

term

like terms

$3(4+12) =$

$3(16)$

48

$3\cdot 4 + 3\cdot 12$

$12 + 36$

48

$2(x+3)$

$2\cdot x + 2\cdot 3$

$2x + 6$

$(x+3)+(x+3)$

$2x+6$

KeyConcept Distributive Property

Symbol For any numbers a, b, and c,
$a(b + c) = ab + ac$ and $(b + c)a = ba + ca$ and
$a(b - c) = ab - ac$ and $(b - c)a = ba - ca$.

Examples

$3(2 + 5) = 3 \cdot 2 + 3 \cdot 5$
$3(7) = 6 + 15$
$21 = 21$

$4(9 - 7) = 4 \cdot 9 - 4 \cdot 7$
$4(2) = 36 - 28$
$8 = 8$

Real-World Example 1 Distribute Over Addition

SPORTS A group of 7 adults and 6 children are going to a University of South Florida Bulls baseball game. Use the Distributive Property to write and evaluate an expression for the total ticket cost.

$2 \cdot (7 + 6) = 2(13)$

$2 \cdot 7 + 2 \cdot 6$

$14 + 12$

26

USF Bulls Baseball Tickets	
Ticket	**Cost ($)**
Adult Single Game	5
Children Single Game (12 and under)	3
Groups of 10 or more Single Game	2
Senior Single Game (65 and over)	3

Source: USF

1. **SPORTS** A group of 3 adults, an 11-year old, and 2 children under 10 years old are going to a baseball game. Write and evaluate an expression to determine the cost of tickets for the group.

$3 \cdot 5 + 1 \cdot 3 + 2 \cdot 3$

$15 + 3 + 6$

24

Example 2 Mental Math

343

Use the Distributive Property to rewrite $7 \cdot 49$. Then evaluate.

$7(50-1)$

$7 \cdot 50 + 7 \cdot -1$

$350 - 7$

$= 343$

$304 \cdot 15$

$15(300+4)$

$4500 + 60$

4560

4560

Guided Practice

Use the Distributive Property to rewrite each expression. Then evaluate.

2A. 304(15)

$5(200+10)$

$1000+50$

1050

1050

2B. $44 \cdot 2\frac{1}{2}$

$44 \cdot 2\frac{1}{2} = 44\left(2 + \frac{1}{2}\right)$

$= 88 + 22$

$= 110$

110

2C. 210(5)

2D. 52(17)

$17(50+2)$

$850 + 34$

884

Example 3 Algebraic Expressions

Rewrite each expression using the Distributive Property. Then simplify.

a. $7(3w + 5)$ $= 7 \cdot 3w = 7 \cdot 5$

$= 21w - 35$

$(3w-5) + (3w-5) + (3w-5) + (3w-5) +$

$(3w-5) + (3w-5) + (3w-5)$

3A. $(8 + 4n)2$

3B. $-6(r + 3g - t)$

3C. $(2 - 5q)(-3)$

3D. $-4(-8 - 3m)$

$(8+4n)2$

$8 \cdot 2 + 4n \cdot 2$

$16 + 8n$

$2(8+4n)$

$2 \cdot 8 + 2 \cdot 4n$

$16 + 8n$

$-3(2-5q)$

$-6 + 15q$

$-6(r+3g+1)$

$-6 \cdot r + -6 \cdot 3g + -6 \cdot 1$

$-6r + -18g + 6$

$-4(-8-3m)$

$-4 \cdot -8 - 4 \cdot 3m$

$32 + 12$

$$2\left(3x^{2}+2x^{0}\right)$$

$$2\cdot 3x^{2}+2\cdot 2x$$

$$6x^{2}+4x$$