Basic Algebra 1.4 $2+3x+7+2x = 9+5x$

Use the distributive property to evaluate expressions

$9+5x$

distributive property

term number, variable, product

3 x 5n

like terms

coefficient $18xy$ $1n$

$2+5x$

equivalent expression

simplify (simplest form)

algebra tiles

Method 1

$2 \times (128 + 12) =$ $2(x+3)$

$2 \cdot 140 =$

280

Method 2 Distributive prop.

$2 \times (128 + 12) = 280$

$2 \cdot 128 = 256$

$2 \cdot 12 = 24$

$(x+3)+(x+3)=2x+6$

$2(x+3)=2\cdot x+2\cdot 3$

$2x+6$

$(3x+1)+(3x+1)=6x+2$

$2(3x+1)=2\cdot 3x+2\cdot 1$

$(2x+4)+(2x+4)+(2x+4)=6x+12$

$3(2x+4)=3\cdot 2x+3\cdot 4$

$6x+12$

Distributive Property	
	Symbols: For any numbers a, b, and c, $a(b + c) = ab + ac$ and $a(b - c) = ab - ac$.
	Numbers: $2(5 + 3) = (2 \cdot 5) + (2 \cdot 3)$ $2(5 - 3) = (2 \cdot 5) - (2 \cdot 3)$

$4(x+3) = 4x + 12$

Does it work?

Examples

Simplify each expression.

1. $3(x + 7)$ $= 3 \cdot x + 3 \cdot 7$

$3x + 21$

algebra tiles

$5(2n + 8) = 5 \cdot 2n + 5 \cdot 8$

$10n + 40$

Your Turn

a. $6(a + b) = 6a + 6b$

b. $(1 + 3t)9 = 9(1 + 3t) = 9 \cdot 1 + 9 \cdot 3t$

$9 + 27t$

Consider the expression $5b + 3b + x + 12x$.

- There are four terms.
- The like terms are $5b$ and $3b$, x and $12x$.
- The coefficients are shown in the table.

Term	Coefficient
$5b$	5
$3b$	3
x	1
$12x$	12

$8b + 13x$

Like terms

Examples Simplify each expression.

3. $4x + 9x = 13x$

4. $a + 7b + 3a - 2b$

$4a + 5b$

Your Turn

c. $5st + 2st$

$7st$

d. $6 + y + 3z + 4y$

$5y + 3z + 6$

Combine like terms!

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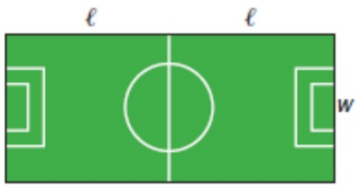
Real World

Example 5

Sports Link

Write an equation representing the area A of a soccer field given its width w and length ℓ as shown in the diagram. Then simplify the expression and find the area if w is 54 yards and ℓ is 60 yards.



A game on a soccer field