Chapter 4

Mrs. Gross

Expressions + Equations

4-1 (p. 173) The Distributive Property

To multiply a sum or difference by a number, multiply each term inside the parenthesis by the number outside the parenthesis.

Examples:

A) $a(b+c) = ab + ac$

B) this one seems a bit backwards, but the concept is the same

$(9-3)8 = 9\cdot 8 - 3\cdot 8$

$72 - 24$

48

Example 1 (p. 173)

a. $5(12+4)$

$5\cdot 12 + 5\cdot 4$

$60 + 20$

80

b. $(20-3)8$

$20\cdot 8 - 3\cdot 8$

$160 - 24$

136

Your Turn:

1A. $(6+3)4$

$6\cdot \square + 3\cdot \square$

$24 + \square$

36

1B. $4(9-2)$

$4\cdot 9 - \square\cdot\square$

$36 - \square$

$\square$

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Go to pg. 175 - you will be using the distributive property more often this way:

Example 3

a. $4(x+5)$
$4x + 4 \cdot 5$
$4x + 20$

{ You don't have to write this step out... as long as you understand it.

b. $(y+10)6$
$6y + 60$

YOUR TURN:

3A $2(a+5)$
$2a +$ ____

3B $(b+6)3$
$3b +$ ____

Example 4 - using subtraction/negative

a. $3(m-4)$
$3m - 12$

b. $-9(n-7)$
$-9n - {}^{-}63$
$-9n + 63$

remember the integer rules
$-9 \cdot 7 = {}^{-}63$

recognize this as a "plussy-plussy"

YOUR TURN:

4A $4(d-3)$
$4d -$ ____

4B $-7(e-4)$
____ $- {}^{-}28$
+

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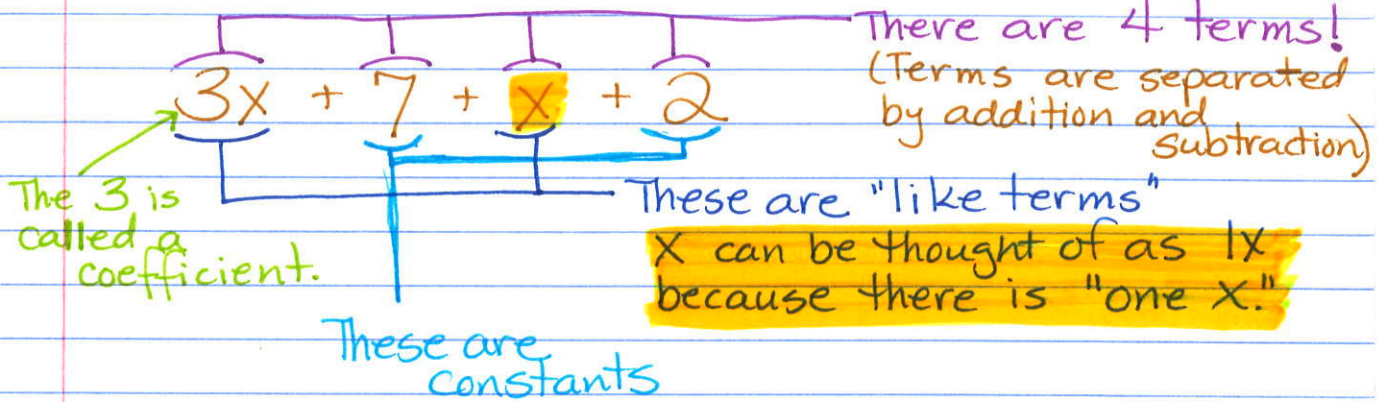
Simplifying Algebraic Expressions



$6x - 2y + x - 5$

- How many terms? 4
- Circle the like terms.
- Which variable can be understood better by using the identity property? x → 1x
- Underline any constants.

Simplified: $7x - 2y - 5$

Your turn:

$8t - 4 + 2y + t + 3$

- How many terms? ____
- Circle the like terms.
- Which variable can be understood better by using the identity property? ____
- Underline any constants.

simplified: $9t - 1 + 2y$

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* An algebraic expression is in simplest form if it has no like terms and no parenthesis.

* Use the distributive property to combine like terms.

p. 181

a. $4x + 6 + 2x = 4x + 2x + 6$ commutative p.
$= (4+2)x + 6$ distributive p.
$= 6x + 6$ simplify

b. $5n + 2 - n - 6 = 5n + 2 + (-n) + (-6)$ definition of subtraction (flip)
$= 5n + 2 + (-1n) + (-6)$ identity p.
$= 5n + (-1n) + 2 + (-6)$ commutative p.
$= (5 + -1)n + 2 + (-6)$ distributive p.
$= 4n + -4$
or better shown
$4n - 4$

You highlight!

c. $6y - 3(x - 2y) = 6y + (-3)[x + (-2y)]$ definition of subtraction (flip)
$= 6y + (-3x) + (-3 \cdot -2)y$ distributive p.
$= 6y + (-3x) + 6y$ simplify
$= 6y + 6y + (-3x)$ commutative p.
$= (6+6)y + (-3x)$ distributive p.
$= 12y + -3x$
or better shown
$12y - 3x$

4-3 pg. 186 Mrs. Gross

Solving Equations by Adding or Subtracting

Use the inverse operation to "un-do" the equation.

Example 2 (p. 187)

a. $x - 7 = -4$
$+7 \quad +7$
$x = 3$

Cancel out the -7 to get the variable by itself

take a second to check your work: $3 - 7 = -4$ (!)

Example 2 (p. 188)

b. $m + 6.7 = 3.4$
$-6.7 \quad -6.7$
$m = -3.3$

Your Turn:

pg. 187 1A $x - 5 = 20$
$+5 \quad +5$
$x =$

1B $y - 6.4 = 10.7$
$y =$

pg. 188 2A $16 + z = 14$
$-16 \quad -16$
$z =$

2B $0.7 + a = 0.4$
$a =$

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4-4 Solving Equations by Multiplying or Dividing

Example 1 (p. 193)

$\frac{5c}{5} = \frac{120}{5}$

$c = 24$

Check your work!

$5 \cdot 24 = 120$ ☺

Remember that you are "un-doing" the coefficient.

Your Turn

1A $\frac{-54}{6} = \frac{6x}{6}$

[redacted] $= x$

CYW: $-54 = 6 \cdot$ [redacted]

1B $\frac{7a}{7} = \frac{63}{7}$

$a =$ [redacted]

CYW: $7 \cdot$ [redacted] $= 63$

Example 4 (p. 195)

$\frac{4}{1} \cdot \frac{y}{4} = -8 \cdot 4$

$y = -32$

check your work!

$\frac{-32}{4} = -8$ ☺

Your Turn

4A $-2 \cdot 7 = \frac{x}{-2} \cdot \frac{-2}{1}$

[redacted] $= x$

CYW: $7 = \frac{-2}{-2}$

Example 5

$\frac{-5}{3} \cdot \frac{-3}{5} x = \frac{-6}{1} \cdot \frac{-5}{3}$

$x = 10$

CYW: $-\frac{3}{5} \cdot \frac{10}{1} = \frac{-6}{1}$ ☺

Your Turn

5A $-\frac{6}{7} m = \frac{-24}{1} \cdot$ [redacted]

$m =$ [redacted]

CYW $\frac{6}{7} \cdot$ [redacted] $= \frac{-24}{1}$