COMBINING TERMS

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Learning Objectives

You are expected to:

- **rewrite** an expression using distributive property
- **rewrite** an expression by combining terms

RECALL about Evaluate Expression

1. Replace the variables with their corresponding given values.
2. Calculate the numerical expression using the **order of operations**.

Evaluate Expressions

$4a^3 - 2b$ when $a = 2,\ b = -3$

$= 4(2)^3 - 2(-3)$

$= 4(8) - 2(-3)$

$= 32 - |(-|6)$

$= 38$

Put parentheses where variable are.

Then substitute values.

Follow order of operations.

CHECK Understanding: Evaluate Expressions

Evaluate the expression $4(a + b)$ when $a = 3$ and $b = -2$!

a) 4

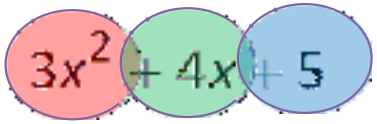
b) -4

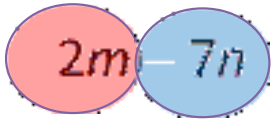
c) 12

d) 2

COMBINING TERMS

Terms: The addends in an expression that is a sum.





Sign stays with the number that comes after it!

Coefficient: The numerical factor in a term.

$5x^2$	Coefficient is 5.
$-3m$	Coefficient is –3 .
y	Coefficient is 1.
$-n$	Coefficient is – 1.

COMBINING LIKE TERMS

Like terms: Terms that have the **same variable(s)** raised to the **same exponents**, or **constant terms**.

Like terms	**Unlike terms**	
$4x$ and $7x$	$2x$ and $8y$	***different variables***
$5y^2$ and $10y^2$	$7t^3$ and $3t^2$	***different exponents***
$8xy$ and $12xy$	x^2y and xy^2	***different exponents***
7 and 15	13 and $15x$	***different variables***

COMBINING LIKE TERMS

To combine like terms,

- add or subtract the coefficients
- keep the variables and their exponents the same.

$10y + 8y = 18y$

$8x - 3x = 5x$

$13y^2 - y^2 = 13y^2 - 1y^2 = 12y^2$

COMBINING LIKE TERMS

$5y^2 + 6 + 4y^2 - 7$

Rewrite. Keep the sign with the number that comes after it.

$= 5y^2 + 4y^2 + 6 - 7$

Combine like terms.

$= 9y^2 - 1$

$18y + 7x - y - 7x$

$= 17y + 0$

$= 17y$

CHECK Understanding: Combining Terms

Simplify: $7x + 8 - 2x - 4$

a) $9x - 4$

b) $9x + 4$

c) $5x - 4$

d) $5x + 4$

DISTRIBUTIVE PROPERTY

***The Distributive Property of* Multiplication over Addition**

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

$2(5 + 6) = 2(11)$
$= 22$

$2(5 + 6) = 2 \cdot 5 + 2 \cdot 6$
$= 10 + 12$
$= 22$

When **evaluating**, don't use the distributive property!!
Follow the order of operations.

DISTRIBUTIVE PROPERTY

$$2(x+y) = 2x + 2y$$

$$-2(-3a-5b) = 6a + 10b$$

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

$$-(5y+8) = -1(5y+8) = -5y - 8$$

Sign stays with the number that comes after it!

Example:
Distributive Property

Simplify the expression $-6(x+7)+2(x-4)$

Solution:

$$-6(x+7)+2(x-4) = -6x-42+2x-8 \quad \text{Distributive Property}$$

$$= -4x-50$$

Expanding Algebra Expression

Expanding Single Brackets

You can 'expand' an expression by multiplying the terms *inside* the bracket by the term *outside*.

a) $5(2x+3) = 10x+15$

b) $-3x(7x-4) = -21x^2+12x$

c) $y^2(3-2y^3) = 3y^2-2y^5$

d) $4x(3x-2x^2+5x^3)$
$= 12x^2-8x^3+20x^4$

e) $2x(5x+3)-5(2x+3)$
$= 10x^2+6x-10x-15$
$= 10x^2-4x-15$

Factorising Algebra Expression

Factorising single brackets

Factorising is the opposite of expanding brackets. An expression is put into brackets by looking for common factors.

		Common Factor	
a)	$3x+9$	3	$=3(x+3)$
b)	x^2-5x	x	$=x(x-5)$
c)	$8x^2+20x$	4x	$=4x(2x+5)$
d)	$9x^2y+15xy^2$	3xy	$=3xy(3x+5y)$
e)	$3x^2-9xy$	3x	$=3x(x-3y)$

You'll learn the factorizing algebra expression more detail on next presentation.

Thanks
for your attention