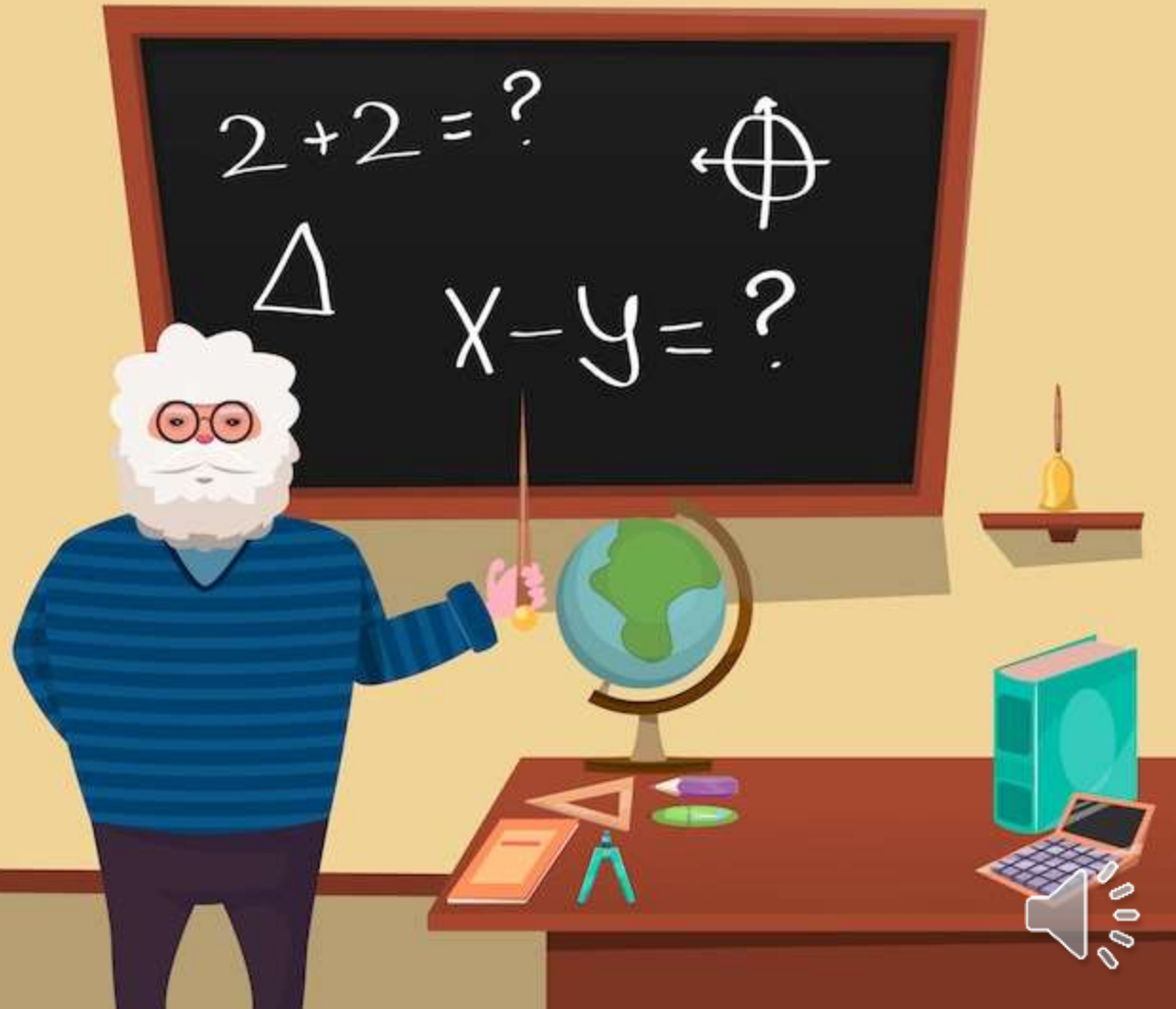
Algebraic Expressions

Part 4



3. A Change of signs

Example : $(x+4)(2x-1)+(2x+3)(1-2x)$

Are 2x-1 and 1-2x equal ??

Do we have a common bracket ??

2x-1 and 1-2x are opposite

$(1-2x) = -(2x-1)$

5= - (-5)

$(2x-1) = -(1-2x)$

-6= -(+6)

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So we can substitute $(1-2x)$ by $-(2x-1)$

- $(x+4)(2x-1)+(2x+3)(1-2x)=$
- $(x+4)(2x-1)-(2x+3)(2x-1)=$

These are opposites

The common factor appears

- $(2x-1)[x+4-(2x+3)]=$
- $(2x-1)(x+4-2x-3)=$
- $(2x-1)(1-x)$

Application : Factorize

a) $(3x-4)(2x+5)+(4-3x)(x-1)$

b) $(6x-7)(3x+5)-(7-6x)(2x-3)$

c) $(8-5x)(2x+1)+(-2x-1)(3-2x)$

d) $(4x-1)(x+3)-(-x-3)(2x-5)$

Pause the video then solve this application

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Now Check Your Answers

Pause the video to check your work !

a) $(3x-4)(2x+5)+(4-3x)(x-1)=(3x-4)(2x+5)-(3x-4)(x-1)$

$=(3x-4)[2x+5-(x-1)]=(3x-4)(2x+5-x+1)=(3x-4)(x+6)$

b) $(6x-7)(3x+5)-(7-6x)(2x-3)=(6x-7)(3x+5)+(6x-7)(2x-3)$

$=(6x-7)(3x+5+2x-3)=(6x-7)(5x+2)$

c) $(8-5x)(2x+1)+(-2x-1)(3-2x)=(8-5x)(2x+1)-(2x+1)(3-2x)$

$=(2x+1)[8-5x-(3-2x)]=(2x+1)(8-5x-3+2x)=(2x+1)(5-3x)$

d) $(4x-1)(x+3)-(-x-3)(2x-5)=(4x-1)(x+3)+(x+3)(2x-5)$

$=(x+3)(4x-1+2x-5)=(x+3)(6x-6)=6(x+3)(x-1)$

4. Difference of Two Squares

$$x^2 - 16$$

How can you factorize this ?? We don't have a common factor !!

How to factorize difference of two squares ?

- $x^2 - 16 = x^2 - 4^2$

a b

$$x^2 - 4^2 = (x - 4)(x + 4)$$

Factorized Form

$$(a - b)(a + b) = a^2 - b^2$$

Examples

- $x^2 - 49 =$ $x^2 - 7^2 =$ $(x - 7)(x + 7)$
- $9x^2 - 25 =$ $(3x)^2 - 5^2 =$ $(3x - 5)(3x + 5)$
- $16x^2 - 81 =$ $(4x)^2 - 9^2 =$ $(4x - 9)(4x + 9)$

- $(2x - 1)^2 - 4 =$ $(2x - 1)^2 - 2^2 =$ $(2x - 1 - 2)(2x - 1 + 2) =$ $(2x - 3)(2x + 1)$

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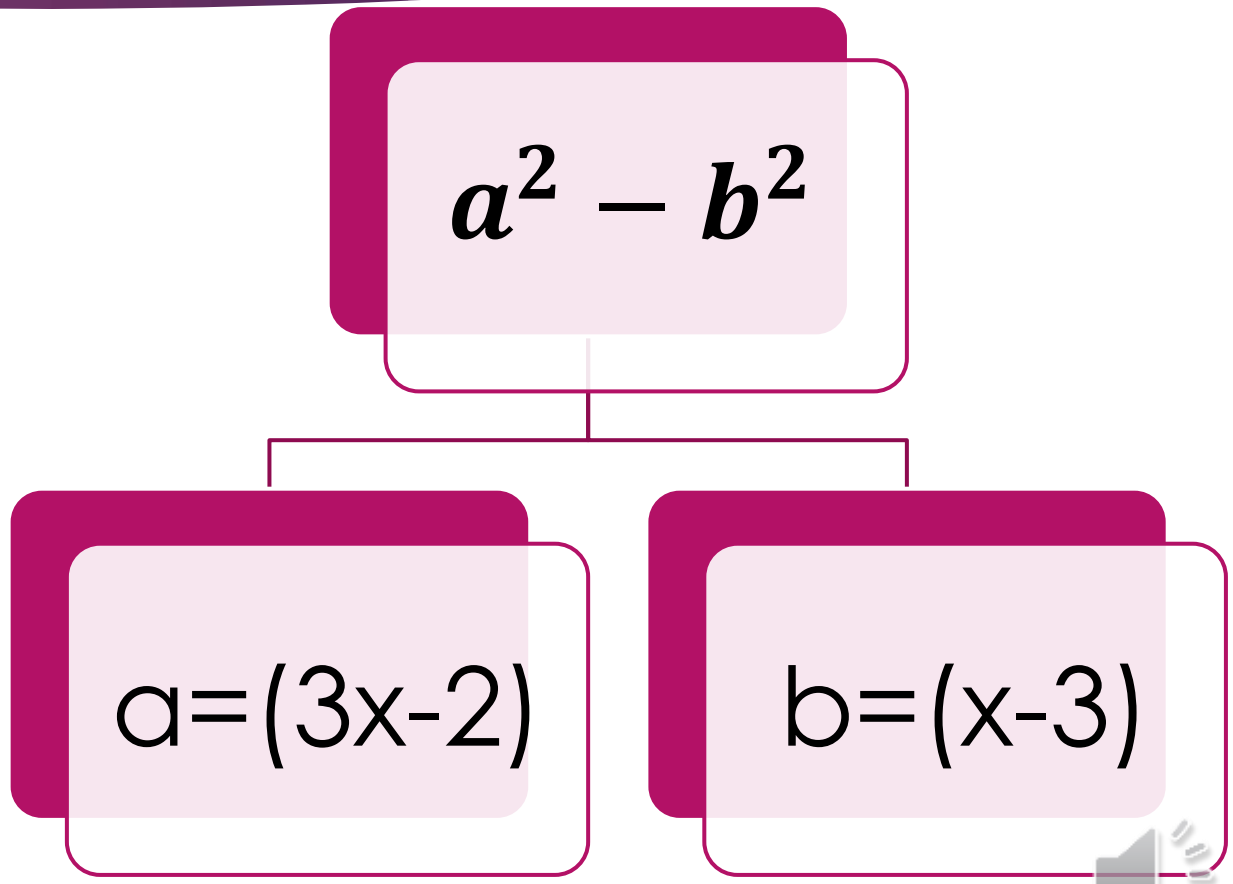
Examples

- $(3x-2)^2-(x-3)^2=$
- $(3x-2+x-3)[3x-2-(x-3)]=$
- $(4x-5)(3x-2-x+3)=$
- $(4x-5)(2x+1)$



Application: Factorize

a) $25x^2 - 81$

b) $9y^2 - \frac{16}{49}$

c) $49x^2 - (2x + 3)^2$

d) $4(5x - 1)^2 - 121(2x - 7)^2$

Pause the video then solve this application

Check Your Answers Now

Pause the video to check your work!

a) $25x^2 - 81 = (5x - 9)(5x + 9)$

b) $9y^2 - \frac{16}{49} = \left(3y - \frac{4}{7}\right)\left(3y + \frac{4}{7}\right)$

c) $49x^2 - (2x + 3)^2 = [7x - (2x + 3)](7x + 2x + 3)$

$= (5x - 3)(9x + 3) = 3(5x - 3)(x + 1)$

d) $4(5x - 1)^2 - 121(2x - 7)^2 = [2(5x - 1)]^2 - [11(2x - 7)]^2 = [10x - 2]^2 - [22x - 77]^2$

$= [10x - 2 - (22x - 77)](10x - 2 + 22x - 77)$

$= (10x - 2 - 22x + 77)(32x - 79) = (75 - 12x)(32x - 79)$