

Algebra 1 - Adding, Subtracting and Multiplying Polynomials - Answer Key

Common Core A-APR.A.1 · maths-pdf.fr/en/

Here are full solutions for the polynomial operations worksheet. Read each step, not just the bold answer, and compare it with your own method. Redo any problem you missed, and note which kind of mistake you made so you can avoid it on the test.

Algebra 1 · Common Core State Standards: **A-APR.A.1**

Exercise 1 - Name and degree

It has three terms and the greatest exponent is 3.

Trinomial of degree 3

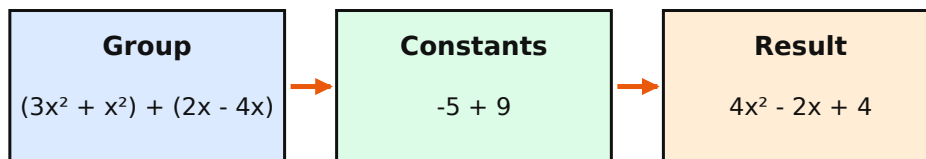
Exercise 2 - Standard form

Order the terms by descending exponent.

$-x^3 + 3x^2 + 4x + 2$. The leading term is $-x^3$.

$-x^3 + 3x^2 + 4x + 2$; **leading coefficient** -1

Exercise 3 - Add polynomials



Combining like terms.

Combine like terms: $(3+1)x^2 + (2-4)x + (-5+9)$.

$4x^2 - 2x + 4$

Exercise 4 - Subtract polynomials

Distribute the negative: $5x^2+3x-2-2x^2+x-6$.

Combine: $3x^2+4x-8$.

$$3x^2+4x-8$$

Exercise 5 - Two variables

Combine the a terms and the b terms: $6a-2b$.

$$6a-2b$$

Exercise 6 - Monomial times polynomial

Multiply $3x$ by each term: $6x^3, -15x^2, 3x$.

$$6x^3-15x^2+3x$$

Exercise 7 - Binomial product

	x	7
x	x^2	$7x$
4	$4x$	28

Partial products.

$$x^2+7x+4x+28.$$

$$x^2+11x+28$$

Exercise 8 - Binomial with a negative

$$x^2+5x-3x-15.$$

Combine: $x^2+2x-15$.

$$x^2+2x-15$$

Exercise 9 - FOIL

First $6x^2$, Outer $-8x$, Inner $3x$, Last -4 .

Combine $-8x+3x=-5x$.

$$6x^2-5x-4$$

Exercise 10 - Square of a binomial

	x	6
x	x^2	$6x$
6	$6x$	36

Area model of the square.

$$(x+6)(x+6)=x^2+6x+6x+36.$$

$$x^2+12x+36$$

Exercise 11 - Square with subtraction

$$x^2+2(x)(-5)+(-5)^2.$$

$$x^2-10x+25$$

Exercise 12 - Difference of squares

The middle terms cancel: $x^2-8x+8x-64$.

$$x^2-64$$

Exercise 13 - Binomial times trinomial

Distribute x: x^3-3x^2+4x . Distribute 2: $2x^2-6x+8$.

Combine: x^3-x^2-2x+8 .

$$x^3 - x^2 - 2x + 8$$

Exercise 14 - Closure

$$(x^2 + 1) + (-x^2 + 3x) = 3x + 1, \text{ which is a polynomial of degree 1.}$$

Polynomials are closed under addition: the sum of two polynomials is always a polynomial, even if the degree drops.

$$3x + 1$$

Exercise 15 - Check by substitution

	x	2
x	x^2	$2x$
3	$3x$	6

The product as an area.

$$\text{Left side: } (4+3)(4+2) = 7 \cdot 6 = 42. \text{ Right side: } 16 + 20 + 6 = 42.$$

Both sides equal 42

Exercise 16 - Rectangle area

$$(x+8)(x+3) = x^2 + 3x + 8x + 24 = x^2 + 11x + 24.$$

$$\text{For } x=5: 25 + 55 + 24 = 104.$$

$$x^2 + 11x + 24; \text{ 104 square feet}$$

Exercise 17 - Square patio

$$(x+4)^2 = x^2 + 8x + 16.$$

$$\text{For } x=6: 36 + 48 + 16 = 100.$$

$$x^2 + 8x + 16; \text{ 100 square feet}$$

Exercise 18 - Profit polynomial

$$P = (-2x^2 + 60x) - (10x + 100).$$

Distribute the negative: $-2x^2 + 60x - 10x - 100 = -2x^2 + 50x - 100.$

For $x = 10$: $-200 + 500 - 100 = 200.$

$-2x^2 + 50x - 100$; **\$200**

Exercise 19 - Triangle perimeter

$$(2x + 3) + (x + 7) + (3x - 2) = 6x + 8.$$

For $x = 4$: sides 11, 11, 10, and $6(4) + 8 = 32.$

$6x + 8$; **32 inches**

Exercise 20 - Box volume

Volume = $2(x + 4)(x + 1)$. First $(x + 4)(x + 1) = x^2 + 5x + 4.$

Multiply by 2: $2x^2 + 10x + 8$. For $x = 3$: $18 + 30 + 8 = 56.$

$2x^2 + 10x + 8$; **56 cubic inches**

Exercise 21 - Deck around a pool

Deck = whole - pool: $(x + 6)(x + 10) - x(x + 4).$

$$(x^2 + 16x + 60) - (x^2 + 4x) = 12x + 60.$$

For $x = 5$: $12(5) + 60 = 120.$

$12x + 60$; **120 square feet**