

Algebra 2 - Polynomial Operations and Identities - Worksheet

Common Core A-APR.A.1, A-APR.C.4 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice polynomial operations and identities (Common Core A-APR.A.1 and A-APR.C.4). The first problems check adding, subtracting and multiplying polynomials, the middle problems add special products and mental math with identities, and the last six are word problems and multi-step tasks that need area models, Pythagorean triples and proofs.

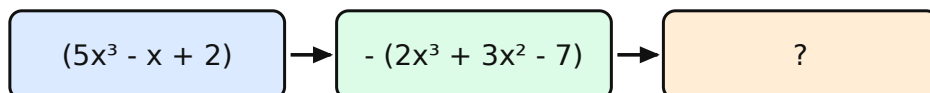
Work in order and show every step. Write each answer in simplest form, and open the answer key only after you have tried the problem yourself.

Algebra 2 · Common Core State Standards: **A-APR.A.1, A-APR.C.4**

Exercise 1 - Add polynomials

Add: $3x^2+2x-5$ plus x^2-4x+9 .

Exercise 2 - Subtract polynomials



Subtract the second polynomial.

Subtract: $5x^3-x+2$ minus $2x^3+3x^2-7$.

Exercise 3 - Degree and leading coefficient

For $7x^2-3x^4+5x-1$, write it in standard form, then name its degree and leading coefficient.

Exercise 4 - Monomial times polynomial

Multiply: $3x(2x^2-x+4)$.

Exercise 5 - Two binomials

	x	-7
x	?	?
4	?	?

Fill in the four cells.

Multiply: $(x+4)(x-7)$.

Exercise 6 - Binomials with coefficients

Multiply: $(2x-3)(3x+5)$.

Exercise 7 - Binomial times trinomial

Multiply: $(x+2)(x^2-3x+4)$.

Exercise 8 - Square of a difference

Expand using an identity: $(x-5)^2$.

Exercise 9 - Difference of squares

Expand: $(3x+2)(3x-2)$.

Exercise 10 - Two variables

Expand: $(2x+3y)^2$.

Exercise 11 - Cube of a binomial

Expand $(x+1)^3$ using $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$.

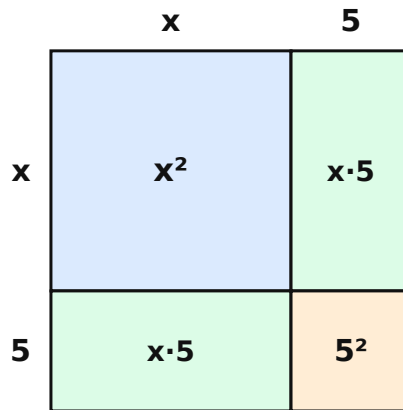
Exercise 12 - Mental math: a square

Use $(a-b)^2$ to compute 47^2 without a calculator.

Exercise 13 - Mental math: product

Use the difference of squares to compute $53 \cdot 47$.

Exercise 14 - Area of a square



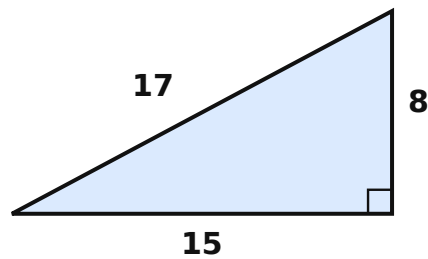
Square with side $x + 5$.

A square patio has side length $x+5$ feet. Write its area as a polynomial in standard form.

Exercise 15 - Verify an identity

Show that $(x+y)^2 - (x-y)^2 = 4xy$.

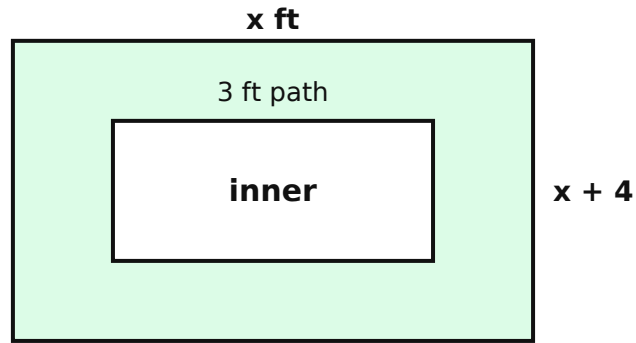
Exercise 16 - Pythagorean triple



Sides generated by $x = 4$, $y = 1$.

Use $x=4$ and $y=1$ in x^2-y^2 , $2xy$, x^2+y^2 to generate a triple, then verify that it satisfies the Pythagorean theorem.

Exercise 17 - Garden path



Inner rectangle with a border.

A rectangular garden measures x feet by $x+4$ feet. A path 3 feet wide surrounds it. Write the area of the path as a polynomial.

Exercise 18 - Ticket revenue

A school play charges $(40-2x)$ dollars per ticket and sells $(120+10x)$ tickets, where x is the number of \$2 price cuts. Write the revenue as a polynomial in x .

Exercise 19 - Difference of cubes of binomials

Simplify $(x+2)^3 - (x-2)^3$.

Exercise 20 - Find the error

Priya wrote $(x+6)^2 = x^2+36$. Explain the mistake, then write the correct expansion.

Exercise 21 - Prove a pattern

Show that the product of two consecutive even integers, plus 1, is a perfect square. Use $2n$ and $2n+2$.