

Algebra 1
Factoring Polynomials Completely

Factoring Polynomials Completely | A1-U08-P10

96 problems · Four activity formats

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Topic focus
This topic is a focused set of 96 practice tasks on Factoring Polynomials Completely.
8 PDFs and a README; 51 buyer pages.

Algebra 1

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Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

Remove the multivariable GCF and resolve the nonmonic binary quadratic that remains. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $12a^4b + 42a^3b^2 - 24a^2b^3$ _____ Bank label: _____	Select a signed multivariable GCF and continue until the residual splits into binomials. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $-12p^4q + 12p^3q^2 + 45p^2q^3$ _____ Bank label: _____
Write the expression as its maximal monomial GCF times primitive binomials. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $54r^4s - 9r^3s^2 - 18r^2s^3$ _____ Bank label: _____	Resolve the common monomial and the remaining homogeneous trinomial. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $12u^3v - 30u^2v^2 - 72uv^3$ _____ Bank label: _____
Pull out the signed z-containing GCF and completely factor the x expression. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $-108x^2z^2 - 99xz^2 - 18z^2$ _____ Bank label: _____	Factor the homogeneous remainder into two linear forms after removing its common monomial. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $4a^3b^2 - 4a^2b^3 - 48ab^4$ _____ Bank label: _____

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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

Select the GCF sign that makes the square-difference pattern immediate. Expression: $-45m^4 + 5m^2$ _____ _____	After removing the greatest shared monomial, identify both scaled square bases. Expression: $32p^3q - 98pq^3$ _____ _____
Extract all common powers, then express the remainder as conjugate binary forms. Expression: $75x^5y^2 - 12x^3y^4$ _____ _____	Preserve the odd shared power of b in the GCF and factor the residual identity. Expression: $98a^4b^3 - 18a^2b^5$ _____ _____
Use the maximal numerical content before applying the special product. Expression: $108m^3n^4 - 48mn^6$ _____ _____	Normalize the negative leading term through the GCF and finish with conjugates. Expression: $-200p^5q + 72p^3q^3$ _____ _____

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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: $15x^3(x+7)^2$ Treat y as part of the GCF and factor the x-quadratic that remains. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $70x^2y - 49xy - 84y$ Your response: _____	Incoming: $8p^2(p-2)(p-7)$ Factor until every nonconstant factor is linear over the integers. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $9y^3 + 18y^2 - 135y$ Your response: _____
Incoming: $4x(x+3)^2$ Give the complete factorization and identify the multiplicity of its binomial factor. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $7a^4 - 70a^3 + 175a^2$ Your response: _____	Incoming: $3x(2x+1)(x+3)$ State the two decisive factoring steps and the final product. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $12x^3 - 40x^2 + 12x$ Your response: _____
START Factor completely, showing the common-factor decision before the quadratic step. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $2x^3 + 10x^2 + 12x$ Your response: _____	Incoming: $18c^2(c+4)(c+9)$ Extract the full GCF and split the resulting nonmonic trinomial. Match the complete requested factorization, with all original domain and verification requirements. An expanded polynomial alone is not the requested response. Expression: $6x^3 + 21x^2 + 9x$ Your response: _____

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Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

Choose the productive first method, justify it from the visible structure, and finish factoring.

Expression: $6x^3 + 30x^2 + 36x$

Available methods: GCF trinomial grouping

Select the method sequence that reaches an integer endpoint rather than stopping after one split.

Expression: $x^4 - 81$

Available methods: GCF difference of squares trinomial

Which method should be tried first, and what complete product does it produce? Explain using the term arrangement.

Expression: $2a^2 + 8a + 3a + 12$

Given structural clue: four terms with matching local quotients

Explain why a GCF should precede the special-product test, then factor completely.

Expression: $12a^4 - 108a^2$

Suggested approach to consider: compare the original terms as squares

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Full Worked Solutions - excerpt

Worked example

Problem. Select the GCF sign that makes the square-difference pattern immediate.

Expression: $-45m^4 + 5m^2$

Answer. $-5m^2(3m - 1)(3m + 1)$

Explanation and check.

Extract $-5m^2$ to leave $9m^2 - 1$, then use bases $3m$ and 1 .

Worked example

Problem. Preserve the odd shared power of b in the GCF and factor the residual identity.

Expression: $98a^4b^3 - 18a^2b^5$

Answer. $2a^2b^3(7a - 3b)(7a + 3b)$

Explanation and check.

The GCF $2a^2b^3$ leaves $49a^2 - 9b^2$, a square difference.