

Algebra 1
Multiplying Binomials and Larger Polynomials

Multiplying Binomials and Larger Polynomials | A1-U08-P05

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
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Topic focus
This topic is a focused set of 96 practice tasks on Multiplying Binomials and Larger Polynomials.
8 PDFs and a README; 56 buyer pages.

Algebra 1

Multiplying Binomials and Larger Polynomials

Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

Multiply all four term pairs and keep unlike x-y monomials separate. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(2x - 1)(x^2 + 3y)$ _____ Bank label: _____	Expand the four products and do not merge terms with different total degrees. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(3a + 2b^2)(a - b)$ _____ Bank label: _____
Generate every row-column pairing and order the resulting monomials by total degree. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(m^2 - 3n)(2m + n^2)$ _____ Bank label: _____	Expand the product, tracking the negative quadratic term through both columns. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(-2p^2 + q)(p + 4q^2)$ _____ Bank label: _____
Multiply all four term pairs and retain both rs and rs^2 as distinct terms. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(5r - 2s^2)(-r + 3s)$ _____ Bank label: _____	Create the complete four-product expansion for the two high-degree binomials. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(x^3 + 2y)(2x^2 - 3y^2)$ _____ Bank label: _____
Expand the product and explain which two partial products create the quadratic coefficient. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(-3x^2 + 2x)(4x - 5)$ _____ Bank label: _____	Expand and order the four monomials by total degree, breaking ties by the exponent of a. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(2a^3 - 3b)(-a^2 + 4b^2)$ _____ 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. A value without its unit is not a complete answer.

Expand the product and report how the two mn contributions determine the final mixed coefficient. Expression: $(3m + 2n)(2m - 3n)$ 	Expand the product first, then evaluate the resulting polynomial at $r = -2$. Expression: $(2r^2 - 3)(r + 4)$ Evaluation: $r = -2$ 																		
Write the four-term expansion, then use it to find the value at $x = 1$ and $y = -1$. Expression: $(x^2 - 2y)(3x + 4y^2)$ Evaluation: $x = 1; y = -1$ 	Fill the lower-right product cell, then add all four cells to form the final polynomial. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="padding: 5px;">×</td> <td style="padding: 5px;">x</td> <td style="padding: 5px;">3</td> </tr> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">x^2</td> <td style="padding: 5px;">$3x$</td> </tr> <tr> <td style="padding: 5px;">2</td> <td style="padding: 5px;">$2x$</td> <td style="padding: 5px;">_____</td> </tr> </table> 	×	x	3	x	x^2	$3x$	2	$2x$	_____									
×	x	3																	
x	x^2	$3x$																	
2	$2x$	_____																	
Complete the branch from row term $2a$ to column term 4, then combine the grid. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="padding: 5px;">×</td> <td style="padding: 5px;">a</td> <td style="padding: 5px;">4</td> </tr> <tr> <td style="padding: 5px;">$2a$</td> <td style="padding: 5px;">$2a^2$</td> <td style="padding: 5px;">_____</td> </tr> <tr> <td style="padding: 5px;">-1</td> <td style="padding: 5px;">-a</td> <td style="padding: 5px;">-4</td> </tr> </table> 	×	a	4	$2a$	$2a^2$	_____	-1	-a	-4	Use both cells in the first row to recover its term label, then write the collected product. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="padding: 5px;">×</td> <td style="padding: 5px;">m</td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">m^2</td> <td style="padding: 5px;">$2m$</td> </tr> <tr> <td style="padding: 5px;">-3</td> <td style="padding: 5px;">$-3m$</td> <td style="padding: 5px;">-6</td> </tr> </table> 	×	m	2	_____	m^2	$2m$	-3	$-3m$	-6
×	a	4																	
$2a$	$2a^2$	_____																	
-1	-a	-4																	
×	m	2																	
_____	m^2	$2m$																	
-3	$-3m$	-6																	

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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: $3x^2 + 5xy - 2y^2$. Expand and group terms by a^2, ab, and b^2. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(2a-b)(a+4b)$ Your response: _____	Incoming: $2r^3 - 7r^2 - 15r$. Multiply all x-y term pairs and combine the xy products. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(x+2y)(3x-y)$ Your response: _____
Incoming: $8m^2-10m-3$. Track the negative leading coefficient through both terms of the second factor. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(-2r+3)(r+7)$ Your response: _____	Incoming: $3m^3+5m^2-2m$. Create the four products and combine the two quadratic terms. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(2r^2+3r)(r-5)$ Your response: _____
Incoming: $3a^3 + a^2b - 6ab - 2b^2$. Keep the linear coefficient exact while combining the two cross products. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $((\frac{1}{2})x+3)(4x-5)$ Your response: _____	Incoming: $2x^2 + 13x + 15$. Multiply all term pairs and collect the linear contributions. Use the complete expanded polynomial as the matching response and preserve every originally required partial product and explanation. Expression: $(4m+1)(2m-3)$ 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.

Expand exactly and verify that the quadratic contributions cancel despite unequal coefficients.

Expression: $(3a - 4)(2a^2 + (\frac{8}{3})a - 5)$

Expand the product, then verify from the standard form that $x = 1$ makes its value zero.

Expression: $(x + 1)(2x^2 - 5x + 3)$ Check Value: $x = 1$

Choose a so the expanded product has no x^2 term, then give the complete resulting polynomial.

Expression: $(2x + a)(3x^2 - 4x + 5)$

Choose an initial pair, record its quadratic product, and then expand by the remaining factor. Explain why your chosen initial pair is useful for keeping the intermediate terms organized, then retain the original requirement to record that intermediate product and multiply by the remaining factor.

Expression: $(x + 1)(x + 2)(x + 3)$

Multiplying Binomials and Larger Polynomials

Full Worked Solutions - excerpt

Worked example

Problem. Form the linear-pair quadratic, multiply by the sparse third factor, and order by descending x exponent.

Expression: $(x - y)(x + 2y)(x^2 + y^2)$

Answer. $x^4 + x^3y - x^2y^2 + xy^3 - 2y^4$.

Explanation and check.

The linear pair is $x^2 + xy - 2y^2$. Multiplication by $x^2 + y^2$ yields the five-term result after the x^2y^2 contributions combine.

Worked example

Problem. Multiply two bivariate factors, then distribute the third and collect degree-three exponent pairs.

Expression: $(x + y)(x + 2y)(2x - y)$

Answer. $2x^3 + 5x^2y + xy^2 - 2y^3$.

Explanation and check.

The first pair is $x^2 + 3xy + 2y^2$. Multiplying by $2x - y$ and collecting gives the homogeneous cubic.