

Algebra 1
Polynomial Identities and Area Models

Polynomial Identities and Area Models | A1-U08-P11

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
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Topic focus
This topic is a focused set of 96 practice tasks on Polynomial Identities and Area Models.
8 PDFs and a README; 153 buyer pages.

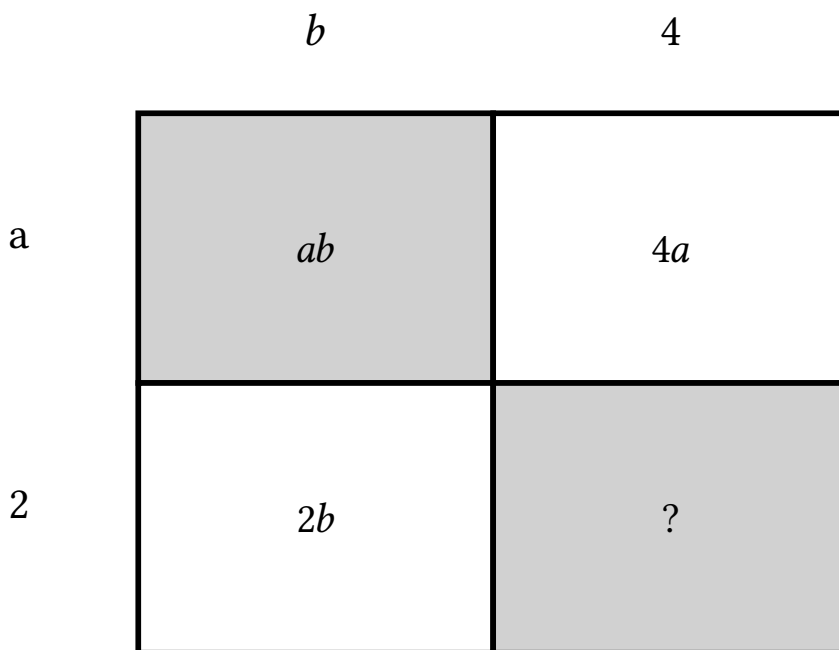
Algebra 1

Polynomial Identities and Area Models

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.

Three subareas of the 2-by-2 partition are labeled and the lower-right label is missing. Find that area and use the complete partition to write the area identity. Match the complete requested identity or exact value, and supply the original area or structural justification. Retain all original dimensions and conditions.



Bank label: _____

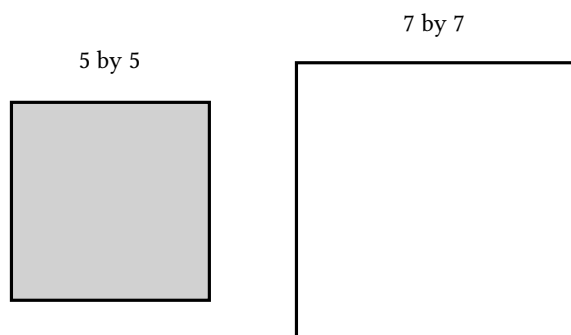
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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

Decide whether the proposed cutout is a valid area proof, and separately evaluate whether the algebraic difference-of-squares equality is true.



Determine whether any real value of c makes the equality an identity. Check the independent coefficient requirements.

Determine whether any c makes $(x + 2)(x + c) = x^2 + 7x + 8$ hold for all real x .

Describe a labeled rectangle construction whose nonoverlapping regions prove the supplied identity. Include the outer dimensions and the cut location.

Use $a(b + c) = ab + ac$ with $a > 0$, $b > 0$, and $c > 0$. Use 2 pieces.

Prove the divisibility claim using the neighboring factors in the supplied identity.

Let n be an odd integer. Use $n^2 - 1 = (n - 1)(n + 1)$ to show that $n^2 - 1$ is divisible by 8.

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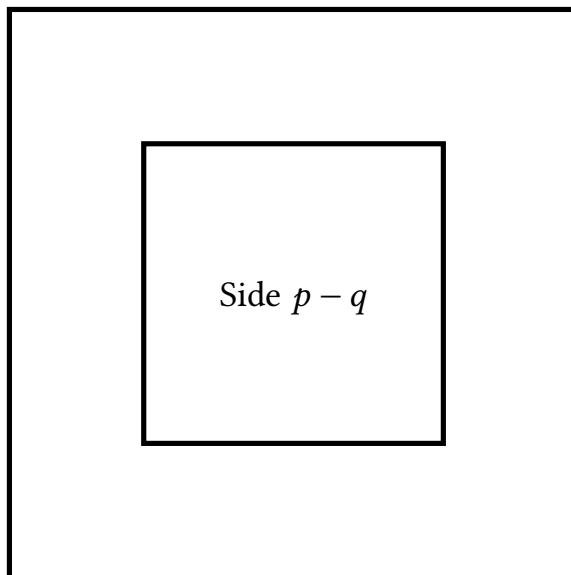
Name: _____ Date: _____ Class: _____

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: $(z + \frac{1}{3})^2 = z^2 + (\frac{2}{3})z + \frac{1}{9}$

Express the frame as a rectangle product. Match the complete requested identity or exact value, and supply the original area or structural justification. Retain all original dimensions and conditions.

Side $p + q$



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.

Determine whether the equality is an identity. Give algebraic evidence that applies to every real input. Choose an algebraic verification route: simplify the difference of the two sides, or transform one side using distributive structure or a known identity. Explain which route suits the displayed expressions, then fulfill every original parameter, counterexample, and all-input requirement.

Compare $3(x + 2)^2 - 3x^2$ with $12x + 12$ for all real x .

The two sides agree at $x = 0$. Decide whether that observation proves the claim, and supply decisive evidence. Choose an algebraic verification route: simplify the difference of the two sides, or transform one side using distributive structure or a known identity. Explain which route suits the displayed expressions, then fulfill every original parameter, counterexample, and all-input requirement.

Compare $(x + 2)(x + 5)$ with $x^2 + 6x + 10$ for all real x . The expressions match at $x = 0$.

Find the value of k that makes the equality an identity, then verify the result for all x . Choose an algebraic verification route: simplify the difference of the two sides, or transform one side using distributive structure or a known identity. Explain which route suits the displayed expressions, then fulfill every original parameter, counterexample, and all-input requirement.

Compare $(x + 3)^2 - x^2$ with $kx + 9$ for all real x , where k is a parameter.

Prove or refute the claim without checking a list of sample inputs. A common structural factor may be useful. Choose an algebraic verification route: simplify the difference of the two sides, or transform one side using distributive structure or a known identity. Explain which route suits the displayed expressions, then fulfill every original parameter, counterexample, and all-input requirement.

Compare $2x(x - 4) + (x - 4)^2$ with $(x - 4)(3x - 4)$ for all real x .

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Full Worked Solutions - excerpt

Worked example

Problem. Identify the incorrect coefficient.

Compare $4(x + 2)^2$ with $4x^2 + 8x + 16$.

Answer. not an identity; the middle coefficient should be 16

Explanation and check.

Four times $x^2 + 4x + 4$ is $4x^2 + 16x + 16$.

Worked example

Problem. Give structural evidence about the claim.

Compare $(x - 3)(x + 3)$ with $x^2 + 9$ for all real x .

Answer. not an identity; the product is $x^2 - 9$

Explanation and check.

Cross terms cancel, while the constants multiply to -9 , not 9 .