**Sets & Steps**
Math Practice & Worked Solutions

**Algebra 1**

# Product, Quotient, Zero & Negative Exponents | Algebra 1 | 4-Topic Bundle

4-topic bundle | 384 problems | Four activity formats

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**01** **Product of Powers**

View individual product and its full preview

**02** **Quotient of Powers**

View individual product and its full preview

**03** **Zero Exponents**

View individual product and its full preview

**04** **Negative Exponents**

View individual product and its full preview

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## In every topic

| | |
|---|---|
| Answer Bank Challenge | 24 tasks |
| Grid Rounds | 24 tasks |
| Match & Move | 24 cards |
| Error Analysis & Strategy | 24 tasks |
| Quick Answer Key and Full Worked Solutions | included |
| Teacher / Parent Use Guide and Terms of Use | included |

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## Product previews

The following preview pages show the cover, all four activity formats, and worked examples for each included resource, in the listed order.

**32 PDFs and 4 READMEs; 219 buyer PDF pages across the 4 products.**

Preview pages are not included in the buyer page count. Check the list against resources you already own.

This is a fixed collection of the listed products. Purchase includes the existing individual resource files. To open a product's online preview, follow its title link and select View Preview.

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**Sets & Steps**
Math Practice & Worked Solutions

## Algebra 1

# Product of Powers

Product of Powers | A1-U07-P01

96 problems · Four activity formats



**Topic focus**

Across 96 tasks this topic asks for exact expression or conclusion with exponent-rule justification.

**8 PDFs and a README; 54 buyer pages.**

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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**Algebra 1**

# Product of Powers

**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.

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| | |
|---|---|
| Treat the equation as a formal power identity in the displayed base $y$. Assume $n$ must be a positive integer. Solve $y^6y^n = y^8$ for $n$, or explain why no admissible value exists. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ | The fixed numerical base $(-2)$ has absolute value greater than 1. Assume $n$ must be a positive integer. Solve $(-2)^7(-2)^n = (-2)^{10}$ for $n$, or explain why no admissible value exists. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ |
| The fixed numerical base 2 has absolute value greater than 1. Assume $n$ must be a positive integer. Solve $2^n \cdot 2^n \cdot 2^3 = 2^{11}$ for $n$, or explain why no admissible value exists. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ | The fixed numerical base 7 has absolute value greater than 1. Assume $n$ must be a positive integer. Solve $7^n \cdot 7^n \cdot 7^n \cdot 7^4 = 7^{19}$ for $n$, or explain why no admissible value exists. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ |
| Treat the equation as a formal power identity in the displayed base $m$. Assume $n$ must be a positive integer. Solve $m^nm^nm^5 = m^{17}$ for $n$, or explain why no admissible value exists. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ | The fixed numerical base 3 has absolute value greater than 1. Assume $n$ must be a positive integer. Solve $3^n \cdot 3^n \cdot 3^3 = 3^8$ for $n$, or explain why no admissible value exists. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ |
| Rewrite $(x+1)^2(x+1)^3$ as one power. Identify the common base and justify the exponent in the result by counting repeated factors. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ | Rewrite $(y-2)^3(y-2)^3$ as one power. Identify the common base and justify the exponent in the result by counting repeated factors. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.<br><br>Bank label: _____ |

**Algebra 1**

# Product of Powers

**Name:** _____ **Date:** _____ **Class:** _____

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.

---

| | |
|---|---|
| Treat the equation as a formal power identity in the displayed base $a$. Assume $n$ must be a positive integer. Solve $a^n a^n a^1 = a^5$ for $n$, or explain why no admissible value exists. | Treat the equation as a formal power identity in the displayed base $b$. Assume $n$ must be a positive integer. Solve $b^n b^n b^n b^2 = b^{11}$ for $n$, or explain why no admissible value exists. |
| Design a same-base product equal to $s^{11}$ using two even positive exponents. All exponents must be positive integers. Give one product and verify every condition, or prove the restrictions incompatible. | Design a same-base product equal to $(u-3)^{12}$ using three distinct exponents, each at least 3. All exponents must be positive integers. Give one product and verify every condition, or prove the restrictions incompatible. |
| Treat the equation as a formal power identity in the displayed base $x$. Assume $n$ must be a positive integer. Solve $x^n x^n x^2 = x^8$ for $n$, or explain why no admissible value exists. | Design a same-base product equal to $v^9$ using two distinct exponents, each greater than 4. All exponents must be positive integers. Give one product and verify every condition, or prove the restrictions incompatible. |

**Algebra 1**

# Product of Powers

**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:** $w^3w^6 = w^9$.

Simplify $x^5y^3x^2$ by combining only powers whose bases are identical. State which factors must remain in separate base groups. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.

Your response: _____

**Incoming:** $p^5q^4p^2 = p^7q^4$.

Rewrite $x^2x^4$ as one power. Identify the common base and justify the exponent in the result by counting repeated factors. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.

Your response: _____

**Incoming:** $p^5p^4 = p^9$.

Rewrite $q^2q^5$ as one power. Identify the common base and justify the exponent in the result by counting repeated factors. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.

Your response: _____

**Incoming:** $r^3r^5 = r^8$.

Rewrite $u^5u^5$ as one power. Identify the common base and justify the exponent in the result by counting repeated factors. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.

Your response: _____

**Incoming:** $x^5y^3x^2 = x^7y^3$.

Rewrite $(-2)^4(-2)^6$ as one power. Identify the common base and justify the exponent in the result by counting repeated factors. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.

Your response: _____

**Incoming:** $v^2v^6 = v^8$.

Rewrite $w^3w^6$ as one power. Identify the common base and justify the exponent in the result by counting repeated factors. Use the requested final expression or admissible exponent as the matching response; also complete the original justification.

Your response: _____

**Algebra 1**

# Product of Powers

**Name:** _____ **Date:** _____ **Class:** _____

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.

---

A first group contains $2$ copies of the base $4$, and a second group contains $3$ more copies of that identical base. Without evaluating the base, explain why multiplying the groups gives $4^5$. Compare two proposed explanations: concatenate the two factor lists and add their lengths, or multiply the two list lengths. Which gives a valid general justification? Explain using the original groups; do not evaluate the base.

---

Audit the claim $x^3x^5 = x^8$. Decide whether it is valid under the product rule. If it is invalid, identify the first structural error and give a repair or a numerical counterexample. A learner justifies this by saying: "Any two powers can be combined by adding their exponents, even when their bases differ." Evaluate the equality and this justification separately. Identify and repair the missing condition in the justification.

---

A first group contains $3$ copies of the base $x$, and a second group contains $4$ more copies of that identical base. Without evaluating the base, explain why multiplying the groups gives $x^7$. Compare two proposed explanations: concatenate the two factor lists and add their lengths, or multiply the two list lengths. Which gives a valid general justification? Explain using the original groups; do not evaluate the base.

---

Audit the claim $y^3y^4 = y^{12}$. Decide whether it is valid under the product rule. If it is invalid, identify the first structural error and give a repair or a numerical counterexample.

# Product of Powers

## Full Worked Solutions - excerpt

### Worked example

**Problem.** Audit the claim $a^2b^5 = a^7$. Decide whether it is valid under the product rule. If it is invalid, identify the first structural error and give a repair or a numerical counterexample.

**Answer.** The claim is invalid: the bases a and $b$ are not identical; the product stays $a^2b^5$.

### Explanation and check.

First check the operation and the exact bases before touching exponents. The bases a and $b$ are not identical; the product stays $a^2b^5$. At $a = 2$ and $b = 3$, the claimed sides are $972$ and $128$.

---

### Worked example

**Problem.** Audit the claim $t^2 + t^3 = t^5$. Decide whether it is valid under the product rule. If it is invalid, identify the first structural error and give a repair or a numerical counterexample.

**Answer.** The claim is invalid: the product rule does not apply across addition.

### Explanation and check.

First check the operation and the exact bases before touching exponents. The product rule does not apply across addition. At $t = 2$, the sides are $12$ and $32$.

**Sets & Steps**
Math Practice & Worked Solutions

## Algebra 1

# Quotient of Powers

Quotient of Powers | A1-U07-P02

96 problems · Four activity formats



**Topic focus**

Across 96 tasks this topic asks for simplified expression, retained restriction, and exact justification.

**8 PDFs and a README; 63 buyer pages.**

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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**Algebra 1**

# Quotient of Powers

**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.

---

| | |
|---|---|
| Assume $x \neq 0$. Simplify $\frac{x^2}{x^1}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ | Assume $y \neq 0$. Simplify $\frac{y^3}{y^2}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ |
| Assume $t \neq 0$. Simplify $\frac{t^4}{t^3}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ | Assume $a \neq 0$. Simplify $\frac{a^5}{a^4}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ |
| Assume $x \neq 2$. Simplify $\frac{(x-2)^7}{(x-2)^5}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ | Assume $y \neq -3$. Simplify $\frac{(y+3)^8}{(y+3)^6}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ |
| Assume $t \neq 2$. Simplify $\frac{(2t-4)^3}{(2t-4)^1}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ | Assume $p \neq -2$. Simplify $\frac{(3p+6)^4}{(3p+6)^2}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.<br><br>Bank label: _____ |

**Algebra 1**

# Quotient of Powers

**Name:** _____ **Date:** _____ **Class:** _____

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.

---

The factor diagram has numerator labels $N1{:}x$, $N2{:}x$, $N3{:}x$ and denominator labels $D1{:}x$, $D2{:}x$. Use the diagram to match every denominator factor with one numerator factor. State the remaining factor count and the nonzero-base condition.

**Numerator**

| N1 | N2 | N3 |
|---|---|---|
| $x$ | $x$ | $x$ |

**Denominator**

| D1 | D2 |
|---|---|
| $x$ | $x$ |

The factor diagram has numerator labels $N1{:}(x-2)$, $N2{:}(x-2)$, $N3{:}(x-2)$, $N4{:}(x-2)$, $N5{:}(x-2)$ and denominator labels $D1{:}(x-2)$, $D2{:}(x-2)$, $D3{:}(x-2)$. Use the diagram to match every denominator factor with one numerator factor. State the remaining factor count and the nonzero-base condition.

**Numerator**

| N1 | N2 | N3 | N4 | N5 |
|---|---|---|---|---|
| $(x-2)$ | $(x-2)$ | $(x-2)$ | $(x-2)$ | $(x-2)$ |

**Denominator**

| D1 | D2 | D3 |
|---|---|---|
| $(x-2)$ | $(x-2)$ | $(x-2)$ |

The factor diagram has numerator labels $N1{:}2$, $N2{:}2$, $N3{:}2$, $N4{:}2$, $N5{:}2$, $N6{:}2$, $N7{:}2$ and denominator labels $D1{:}2$, $D2{:}2$, $D3{:}2$, $D4{:}2$. Use the diagram to match every denominator factor with one numerator factor. State the remaining factor count and the nonzero-base condition.

**Numerator**

| N1 | N2 | N3 | N4 | N5 | N6 | N7 |
|---|---|---|---|---|---|---|
| 2 | 2 | 2 | 2 | 2 | 2 | 2 |

**Denominator**

| D1 | D2 | D3 | D4 |
|---|---|---|---|
| 2 | 2 | 2 | 2 |

The factor diagram has numerator labels $N1{:}(y+3)$, $N2{:}(y+3)$, $N3{:}(y+3)$, $N4{:}(y+3)$, $N5{:}(y+3)$, $N6{:}(y+3)$ and denominator labels $D1{:}(y+3)$, $D2{:}(y+3)$. Use the diagram to match every denominator factor with one numerator factor. State the remaining factor count and the nonzero-base condition.

**Numerator**

| N1 | N2 | N3 | N4 | N5 | N6 |
|---|---|---|---|---|---|
| $(y+3)$ | $(y+3)$ | $(y+3)$ | $(y+3)$ | $(y+3)$ | $(y+3)$ |

**Denominator**

| D1 | D2 |
|---|---|
| $(y+3)$ | $(y+3)$ |

**Algebra 1**

# Quotient of Powers

**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:** $\frac{a^8(3p+6)^9}{a^3(3p+6)^5} = a^5(3p+6)^4$; original denominator conditions: $a \neq 0$ and $p \neq -2$.

Assume $p \neq -2$. Simplify $\frac{(3p+6)^{12}}{(3p+6)^6}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.

Your response: _____

**Incoming:** $\frac{(r+1)^8}{(r+1)^4} = (r+1)^4$; original condition: $r \neq -1$.

Simplify $\frac{(x-2)^8 \cdot 5^2 (y+3)^6}{(x-2)^4 (y+3)^3}$. Cancel and subtract exponents separately for each exact base, preserve any unmatched numerator factor, and list every restriction inherited from the original denominator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.

Your response: _____

**Incoming:** $\frac{t^6 a^5}{t^3 a^2} = t^3 a^3$; original denominator conditions: $t \neq 0$ and $a \neq 0$.

Assume $r \neq -1$. Simplify $\frac{(r+1)^8}{(r+1)^4}$ by displaying the cancellation count, then state the positive exponent left in the numerator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.

Your response: _____

**Incoming:** $\frac{m^9(r+1)^9}{m^4(r+1)^5} = m^5(r+1)^4$; original denominator conditions: $m \neq 0$ and $r \neq -1$.

Simplify $\frac{(y+3)^6 a^6 n^6}{(y+3)^1 n^2}$. Cancel and subtract exponents separately for each exact base, preserve any unmatched numerator factor, and list every restriction inherited from the original denominator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.

Your response: _____

**Incoming:** $\frac{(3p+6)^{12}}{(3p+6)^6} = (3p+6)^6$; original condition: $p \neq -2$.

Simplify $\frac{m^9(r+1)^9}{m^4(r+1)^5}$. Cancel and subtract exponents separately for each exact base, preserve any unmatched numerator factor, and list every restriction inherited from the original denominator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.

Your response: _____

**Incoming:** $\frac{a^7}{a^2} = a^5$; original condition: $a \neq 0$.

Simplify $\frac{2^8 \cdot 3^7}{2^4 \cdot 3^4}$. Cancel and subtract exponents separately for each exact base, preserve any unmatched numerator factor, and list every restriction inherited from the original denominator. For the matching response, record both the requested final power/product or exponent and all original denominator restrictions. Also complete the original explanation.

Your response: _____

**Algebra 1**

# Quotient of Powers

**Name:** _____ **Date:** _____ **Class:** _____

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.

---

Simplify $\frac{x^2t^2y^3}{x^1y^2}$. Preserve any unmatched numerator factor and list every restriction inherited from the original denominator. Choose between matching numerator and denominator factors by identical whole base, or matching factors merely because their exponents agree. Justify which strategy applies to this quotient, then use it to complete the original simplification and domain requirements.

---

Simplify $\frac{t^3a^3}{t^2a^2}$. Preserve any unmatched numerator factor and list every restriction inherited from the original denominator. Choose between matching numerator and denominator factors by identical whole base, or matching factors merely because their exponents agree. Justify which strategy applies to this quotient, then use it to complete the original simplification and domain requirements.

---

Simplify $\frac{(x-2)^4(y+3)^3}{(x-2)^3(y+3)^2}$. Preserve any unmatched numerator factor and list every restriction inherited from the original denominator. Choose between matching numerator and denominator factors by identical whole base, or matching factors merely because their exponents agree. Justify which strategy applies to this quotient, then use it to complete the original simplification and domain requirements.

---

Simplify $\frac{(2t-4)^5a^5m^4}{(2t-4)^4m^3}$. Preserve any unmatched numerator factor and list every restriction inherited from the original denominator. Choose between matching numerator and denominator factors by identical whole base, or matching factors merely because their exponents agree. Justify which strategy applies to this quotient, then use it to complete the original simplification and domain requirements.

# Quotient of Powers

## Full Worked Solutions - excerpt

### Worked example

**Problem.** Audit the worked simplification: $\frac{3^8}{3^3} = 3^{11}$. Identify the first quotient-rule or domain error, repair it, and use the supplied structure or a counterexample to justify the verdict.

**Answer.** The work is invalid: a quotient subtracts exponent counts: the repair is $3^5$.

### Explanation and check.

Check exact base equality, then subtract denominator exponent from numerator exponent, and finally retain every original denominator exclusion. A quotient subtracts exponent counts: the repair is $3^5$. The numerator has only five uncanceled copies.

---

### Worked example

**Problem.** Audit the worked simplification: $\frac{(x-1)^7}{(x-1)^3} = (x-1)^4$ for every real $x$. Identify the first quotient-rule or domain error, repair it, and use the supplied structure or a counterexample to justify the verdict.

**Answer.** The work is invalid: the power is correct, but the domain must keep $x \neq 1$.

### Explanation and check.

Check exact base equality, then subtract denominator exponent from numerator exponent, and finally retain every original denominator exclusion. The power is correct, but the domain must keep $x \neq 1$. At $x = 1$, the original denominator is zero.

**Sets & Steps**
Math Practice & Worked Solutions

## Algebra 1

# Zero Exponents

Zero Exponents | A1-U07-P04

96 problems · Four activity formats



**Topic focus**

Across 96 tasks this topic asks for exact value, condition, or boundary-aware conclusion with justification.

**8 PDFs and a README; 50 buyer pages.**

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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**Algebra 1**

# Zero Exponents

**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.

---

| | |
|---|---|
| Evaluate $(4-11)^0$. First compute the expression that forms the base; then decide whether the zero power is defined. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ | Evaluate $((3)(6)-18)^0$ under the real-number zero-exponent convention used in this course. Explain the boundary case. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ |
| Evaluate $-(-5)^0$. State which operations are outside the exponent's scope. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ | Evaluate $3^0+11^0$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ |
| Evaluate $6^0-(-4)^0$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ | Evaluate $\frac{8}{5^0}$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ |
| Evaluate $(2\cdot 5)^0+3$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ | Find the exact real domain of $((2x+3)(x-4))^0$. Account for every way the complete base can be zero or undefined. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.<br><br>Bank label: _____ |

**Algebra 1**

# Zero Exponents

**Name:** _____ **Date:** _____ **Class:** _____

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.

---

| | |
|---|---|
| Evaluate $((-3)^2 + 1)^0$. First compute the expression that forms the base; then decide whether the zero power is defined. | Evaluate $((\frac{14}{7}) - 5)^0$. First compute the expression that forms the base; then decide whether the zero power is defined. |
| Evaluate $2^0 \cdot 9^0$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. | Evaluate $4(6^0 + 10^0)$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. |
| Evaluate $2(3 + 4)^0$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. | Evaluate $3 - 2(-7)^0$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. |

## Algebra 1

# Zero Exponents

**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:** undefined

For which real $x$ is $(x-3)^0$ defined? Give the restriction before simplifying the power. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.

Your response: _____

**Incoming:** $-\frac{1}{2}$

Determine whether $0(4-4)^0$ is defined. Do not let an outside factor or operation hide a zero base. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.

Your response: _____

**Incoming:** $-1$

Evaluate $4 \cdot 3^0$. State which operations are outside the exponent's scope. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.

Your response: _____

**Incoming:** 5

Evaluate $\frac{3^0}{7}$. Replace only each defined zero-powered group by 1 and retain every operation outside that group. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.

Your response: _____

**START**

Evaluate $((2^3)-3)^0$. First compute the expression that forms the base; then decide whether the zero power is defined. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.

Your response: _____

**Incoming:** all real x except x = 7

Find the exact real domain of $((x-2)(x+5))^0$. Account for every way the complete base can be zero or undefined. Use the complete requested value, domain, or coefficient conditions as the matching response and retain the original explanation and restrictions.

Your response: _____

**Algebra 1**

# Zero Exponents

**Name:** _____ **Date:** _____ **Class:** _____

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.

---

Evaluate $2^0$. Identify the entire base before applying the zero-exponent rule. Choose a justified first step: apply the nonzero-base rule directly if its condition is already established, or first evaluate/check the entire base to establish whether the rule applies. Explain your choice for this expression, then give its value or explain why it is undefined.

---

Evaluate $(-2)^0$. Identify the entire base before applying the zero-exponent rule. Choose a justified first step: apply the nonzero-base rule directly if its condition is already established, or first evaluate/check the entire base to establish whether the rule applies. Explain your choice for this expression, then give its value or explain why it is undefined.

---

Evaluate $(\frac{1}{2})^0$. Identify the entire base before applying the zero-exponent rule. Choose a justified first step: apply the nonzero-base rule directly if its condition is already established, or first evaluate/check the entire base to establish whether the rule applies. Explain your choice for this expression, then give its value or explain why it is undefined.

---

Evaluate $(-\frac{3}{4})^0$. Identify the entire base before applying the zero-exponent rule. Choose a justified first step: apply the nonzero-base rule directly if its condition is already established, or first evaluate/check the entire base to establish whether the rule applies. Explain your choice for this expression, then give its value or explain why it is undefined.

# Zero Exponents

## Full Worked Solutions - excerpt

### Worked example

**Problem.** Determine whether $5 + 0(9 - 9)^0$ is defined. Do not let an outside factor or operation hide a zero base.

**Answer.** undefined

**Explanation and check.**

The powered base is zero, so the product term is undefined before the outside zero can act; hence the whole sum is undefined.

---

### Worked example

**Problem.** Determine whether $-2((3 \cdot 3 - 9)^0) + 7$ is defined. Do not let an outside factor or operation hide a zero base.

**Answer.** undefined

**Explanation and check.**

The grouped base $3 \cdot 3 - 9$ equals zero. External multiplication and addition cannot make that zero power defined.

**Sets & Steps**
Math Practice & Worked Solutions

### Algebra 1

# Negative Exponents

Negative Exponents | A1-U07-P05

96 problems · Four activity formats



**Topic focus**

Across 96 tasks this topic asks for exact positive-exponent form, integer exponent, ordering, or domain-aware correction.

**8 PDFs and a README; 52 buyer pages.**

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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**Algebra 1**

# Negative Exponents

**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.

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| | |
|---|---|
| Rewrite $(-3)^{-2}$ using a positive exponent, then give its exact value. Invert the complete base rather than changing its sign. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ | Rewrite $x^{-2}$ using only positive exponents and state the original real-domain condition. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ |
| Rewrite $y^{-5}$ using only positive exponents and state the original real-domain condition. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ | Rewrite $(-m)^{-3}$ using only positive exponents and state the original real-domain condition. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ |
| Rewrite $(2a)^{-2}$ using only positive exponents and state the original real-domain condition. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ | Rewrite $(-3b)^{-3}$ using only positive exponents and state the original real-domain condition. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ |
| Rewrite $(uv)^{-2}$ using only positive exponents and state the original real-domain condition. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ | Rewrite $(-rs)^{-3}$ using only positive exponents and state the original real-domain condition. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.<br><br>Bank label: _____ |

**Algebra 1**

# Negative Exponents

**Name:** _____ **Date:** _____ **Class:** _____

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.

| | |
|---|---|
| Rewrite $(x-4)^{-2}$ using only positive exponents and state the original real-domain condition. | Rewrite $(t+7)^{-3}$ using only positive exponents and state the original real-domain condition. |
| Rewrite $(2p-5)^{-1}$ using only positive exponents and state the original real-domain condition. | Rewrite $(3q+1)^{-4}$ using only positive exponents and state the original real-domain condition. |
| Rewrite $((k+2)(k-1))^{-2}$ using only positive exponents and state the original real-domain condition. | Rewrite $(z^2+1)^{-3}$ using only positive exponents and state the original real-domain condition. |

**Algebra 1**

# Negative Exponents

**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:** $\frac{1}{4^2} = \frac{1}{16}$

Rewrite $5^{-3}$ using a positive exponent, then give its exact value. Invert the complete base rather than changing its sign. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.

Your response: _____

**START**

Rewrite $2^{-1}$ using a positive exponent, then give its exact value. Invert the complete base rather than changing its sign. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.

Your response: _____

**Incoming:** $(\frac{7}{4})^2 = \frac{49}{16}$

Rewrite $(\frac{5}{2})^{-2}$ with a positive exponent and evaluate exactly. Preserve the sign as part of the reciprocal base. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.

Your response: _____

**Incoming:** $\frac{1}{10^1} = \frac{1}{10}$

Rewrite $10^{-3}$ using a positive exponent, then give its exact value. Invert the complete base rather than changing its sign. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.

Your response: _____

**Incoming:** $\frac{1}{6^2} = \frac{1}{36}$

Rewrite $10^{-1}$ using a positive exponent, then give its exact value. Invert the complete base rather than changing its sign. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.

Your response: _____

**Incoming:** $(\frac{4}{3})^2 = \frac{16}{9}$

Rewrite $(\frac{3}{5})^{-3}$ with a positive exponent and evaluate exactly. Preserve the sign as part of the reciprocal base. Use the requested exact positive-exponent expression/value as the matching response, complete the original explanation, and retain every stated nonzero assumption.

Your response: _____

**Algebra 1**

# Negative Exponents

**Name:** _____ **Date:** _____ **Class:** _____

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.

Assume $x$ and $y$ are nonzero. Rewrite $x^{-2}y^{3}$ using only positive exponents. Explain which factor crosses the fraction bar. Choose a route: replace each negative-powered factor by its reciprocal before combining, or first combine signed exponents of identical bases and then rewrite the result with positive exponents. Explain why your chosen route fits this expression, use it, and retain all original nonzero assumptions.

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# Negative Exponents

## Full Worked Solutions - excerpt

### Worked example

**Problem.** Compare $3^{-4}$ and $3^{-2}$ using <, =, or > without relying on decimal approximations. Explain the reciprocal order or negative-base parity that decides the result.

**Answer.** $3^{-4} < 3^{-2}$

**Explanation and check.**

Because $3^4 > 3^2 > 0$, their reciprocals satisfy $3^{-4} < 3^{-2}$.

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### Worked example

**Problem.** A student rewrites $(2x)^{-2}$ as $\frac{1}{2x^2}$. Identify the first structural error, then give the corrected expression and every original-domain restriction.

**Answer.** $(2x)^{-2} = \frac{1}{4x^2}$, with $x \neq 0$.

**Explanation and check.**

The exponent applies to the entire product, so both $2$ and $x$ must be squared after inversion.