

Rule Reasons Answer Key

1. x^7 . Sample explanation: Multiplying powers with the same base combines all the factors. There are 3 x's and 4 more x's, so there are 7 factors of x.
2. m^5 . Sample explanation: Matching factors cancel when dividing. Eight factors of m divided by three factors of m leave five factors of m.
3. a^{10} . Sample explanation: Each of the 2 factors of a is repeated 5 times, so there are $2 \times 5 = 10$ total factors of a.
4. $9b^2$. Sample explanation: The exponent applies to every factor inside the parentheses. Both 3 and b are squared.
5. $\frac{y^3}{z^3}$. Sample explanation: The exponent applies to both the numerator and the denominator because the entire quotient is raised to the third power.
6. c^7 . Sample explanation: Multiplying powers with the same base combines all the factors. Five factors of c plus two more factors give seven factors of c.

Teacher's Guide

- Model one example by expanding the expression into repeated multiplication before introducing the exponent rule.
- Encourage students to use mathematical vocabulary such as factors, base, exponent, combine, and cancel in their explanations.
- Provide sentence starters such as "There are ___ factors of..." or "The exponent applies to..." for students who need language support.
- Have students compare explanations with a partner and discuss whether both accurately describe the rule.
- Invite volunteers to share explanations aloud and identify the exponent property used in each problem.
- Extend learning by asking students to write their own exponent expression and explain the rule using repeated multiplication without naming the property directly.