Laws of exponents for Grade 9

Practice worksheet - Maths · Grade 9

Name: _____ Date: _____

Show your working. Answers and explanations follow on a separate page.

Try each task before opening its answer. Give an example or reason, not only a label.

Write an answer and your reason before opening the explanation. Check the reasoning as well as the final answer.

1. Expand 4^3 and evaluate.

2. Simplify $5^2 \times 5^3$.

3. Simplify $2^7 \div 2^4$.

4. Simplify $(3^2)^2$.

5. Find 11^0.

6. Find 4^{-2}.

7. Find $(2/5)^{-2}$.

8. Find $(-5)^2$ and -5^2.

9. Find $(-2)^3$.

10. Does $3^2 + 3^2$ equal 3^4?

11. Find 81^(1/2).

12. Find 8^(2/3).

13. Find 25^(-1/2).

14. Simplify y^6/y^2 and state the excluded value.

15. Evaluate $2^2 \times 3^2$ using a common exponent.

16. Is $(1/2)^4$ greater than $(1/2)^2$?

Answers and explanations

Answer key - Maths · Grade 9

Laws of exponents for Grade 9

1. $4 \times 4 \times 4 = 64$.

The exponent counts factors, not a multiplier of the base.

2. $5^5 = 3{,}125$.

Same-base multiplication adds exponents.

3. $2^3 = 8$.

Cancel four of the seven factors of two.

4. $3^4 = 81$.

Two groups of two factors make four factors.

5. 1.

The base is nonzero.

6. 1/16.

Take the reciprocal of 4^2.

7. 25/4.

Invert the fraction and square: $(5/2)^2$.

8. 25 and -25 respectively.

The brackets change whether the minus is part of the base.

9. -8.

Three negative factors give a negative product.

10. No. It equals 18, while $3^4 = 81$.

The product rule does not apply to addition.

11. 9.

This denotes the positive square root.

12. 4.

The cube root is 2, and $2^2 = 4$.

13. 1/5.

Take the reciprocal of the positive square root of 25.

14. y^4, with $y \neq 0$.

The original denominator is zero at $y = 0$.

15. $(2 \times 3)^2 = 36$.

A product raised to the same integer power can be combined this way.

16. No: 1/16 is less than 1/4.

For a base between zero and one, larger positive integer powers are smaller.