

Quiz



October 18, 2019

Section 2.4

Exponent Laws I

Write each expression as a product
[Repeated multiplication] and then
evaluate:

| | Product [repeated multiplication] | Evaluate | Single Power |
|---------------------------|---|----------|--------------|
| 1) $3^2 \times 3^2$ | $3 \times 3 \times 3 \times 3$ | 81 | 3^4 |
| 2) $2^2 \times 2^5$ | $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ | 128 | 2^7 |
| 3) $(-5)^2 \times (-5)^4$ | $(-5)(-5)(-5)(-5)(-5)(-5)$ | 15625 | $(-5)^6$ |

Exponent Law for a Product of Powers

To multiply powers with the same base, add the exponents.

$$a^m \times a^n = a^{m+n} \leftarrow \text{middle step}$$

must be the same base

single power $\left\{ \begin{array}{l} \text{one base} \\ \text{one exponent} \end{array} \right.$

$$8^4 \times 8^3 = 8^{4+3} \quad \text{middle step}$$

$$8 \times 8 \times 8 \times 8 \times 8 \times 8 \times 8 \times 8 = 8^7 \quad \text{single power}$$



IT'S THE LAW

1. Write as a single power.
2. Evaluate

1) $7^2 \times 7^4$

middle step

7^{2+4}

single
power

7^6

Evaluate

117 649

2) $(-2)^5 \times (-2)^3$

$(-2)^{5+3}$

$(-2)^8$

256

3) $4^5 \times 4^1$

4^{5+1}

4^6

4096

Write as a repeated multiplication

1)

$$\frac{2^6}{2^2}$$

Repeated Multiplication

$$\frac{\cancel{2} \times \cancel{2} \times 2 \times 2 \times 2 \times 2 \times 2}{\cancel{2} \times \cancel{2}}$$

Evaluate

Single
Power

$$2^4$$

2)

$$\frac{7^6}{7^4}$$



$$\frac{(-5)^7}{(-5)^3}$$

Exponent Law for a Quotient of Powers

[dividing]

To divide powers with the same base, subtract the exponents.

$$a^m \div a^n = a^{m-n} \quad \left. \vphantom{a^m \div a^n} \right\} \frac{a^m}{a^n} = a^{m-n}$$

The base must be the same!

Middle step single

power

a) $(-2)^6 \div (-2)^3$

Express as a **single power** then **evaluate**

$$a) \frac{5^8}{5^2} =$$

middle step

Single power

Evaluate

$$b) \frac{(-2)^3}{(-2)^0}$$

$$c) 8^7 \div 8^4$$

Express as a single power.

$$a) 3^2 \times 3^4 \div 3^3$$

Middle step

$$b) (-4)^8 \div (-4)^3 \times (-4)^2$$

middle step

Express as a single power:

$$1. 3^4 \times 3^6 \div 3^2$$

$$2. \frac{3^8 \times 3^9 \times 3}{3^4 \times 3^2}$$

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Answers]

Questions 4, 5, 7, 8

$$\begin{array}{l} \#4. \\ a) 5^5 \times 5^4 \\ \quad 5^{5+4} \\ \quad 5^9 \end{array}$$

$$\begin{array}{l} \#5.a) 4^5 \div 4^3 \\ \quad 4^{5-3} \\ \quad 4^2 \end{array}$$

Quos
Middle Step
Single Power

$$\#7, \#8. a) 3^4 \times 3^9 \div 3^{11} \\ 3^{4+9-11}$$

