Review Lesson 8

NAME:

Exponent Rules

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Start by logging on to the Digital Toolbox and navigating to the Online Lesson for instructions.

Objectives

⊘ Simplify expressions with the exponent rules.

Introduced in:

Algebra 1: Principles of Secondary Mathematics

Lessons 19 and 28

M Exponent Rules

- Fill in the guided notes as you watch the video in the Online Lesson.

Exponent Rules

Where $\{a, b, c \in \mathbb{Q}\}$ and a > 0

1)
$$a^b \cdot a^c = a^{b+c}$$

2)
$$(a^b)^c = a^{b \cdot c}$$

3)
$$(ab)^c = a^c b^c$$

4)
$$a^b = \frac{1}{a^{-b}}$$
 or $a^{-b} = \frac{1}{a^b}$

5)
$$a^0 = 1$$

$$\mathbf{6)} \quad \left(\frac{a}{b}\right)^c = \frac{a^c}{b^c}$$

7)
$$\frac{a^b}{a^c} = a^{b-c}$$
 or $\frac{1}{a^{c-b}}$

$$8) \quad a^{\frac{n}{d}} = \sqrt[d]{a^n}$$

Example 1

(b) Complete the example as you watch the video in the Online Lesson.

Simplify.

$$(2x^3y^4)^4$$

Example 2

(b) Complete the example as you watch the video in the Online Lesson.

Simplify the expression using only positive exponents.

$$\left(\frac{x^5 z^3}{x^{11} y^{-6}}\right) \left(\frac{z^4}{x^{10} y^{-2}}\right)^{\frac{1}{2}}$$

$$\left(\frac{y^6 z^3}{x^6}\right) \left(\frac{z^2}{x^5 y^{-1}}\right)$$

Practice

Simplify. Write expressions with positive exponents only.

1)
$$\frac{p^{-2}q^{-4}}{4r^{-\frac{1}{2}}}$$

2)
$$(15x^5y)(4x^3y^2)$$

3)
$$\frac{x^0 y^3}{2^3}$$

4)
$$\left(\frac{2x^5}{3}\right)^3$$

$$5) \quad \frac{3^{-1}a^{-5}b^2}{5c^6d}$$

6)
$$(10x^2y)\left(\frac{1}{2}x^9y^{-4}\right)(4xy^3)$$

Simplify. Write expressions with positive exponents only.

$$7) \quad \frac{3^2 x^{-6}}{2^{-1} x^3}$$

8)
$$\left(\frac{4x^{-6}y}{5z^5}\right)^{-2}$$

9)
$$\left(\frac{a^{18}b^{-3}}{a^9b^6}\right)\left(\frac{a^4b^{-5}}{a^{11}b^7}\right)$$

10)
$$(9xyz)^2 \left(\frac{x^4z^{-7}}{3y^8}\right)$$

11)
$$\left(\frac{5^{-1}x^3}{y^4z^{-5}}\right)\left(\frac{z^5}{x^4}\right)^2$$

12)
$$\left(\frac{10^{-1}b^3}{3a^2c^{-4}}\right)\left(\frac{a^5b^{-3}}{3^{-2}c}\right)$$

To continue, return to the Online Lesson.