Swift - Day 5
Lesson 5
8th Gr. Math

NAME _____ DATE _____ PERIOD _____

Lesson 5 Reteach

Negative Exponents

Any nonzero number to the zero power is 1. Any nonzero number to the negative n power is the multiplicative inverse of the number to the nth power.

Example 1

Write each expression using a positive exponent.

a. 7^{-3}

$7^{-3} = \frac{1}{7^3}$ Definition of negative exponent

b. a^{-4}

$a^{-4} = \frac{1}{a^4}$ Definition of negative exponent

Example 2

Evaluate each expression.

a. 5^{-4}

$5^{-4} = \frac{1}{5^4}$ Definition of negative exponent

$= \frac{1}{625}$ $5^4 = 5 \cdot 5 \cdot 5 \cdot 5$

b. $(-3)^{-5}$

$(-3)^{-5} = \frac{1}{(-3)^5}$ Definition of negative exponent

$= \frac{1}{-243}$ $(-3)^5 = (-3) \cdot (-3) \cdot (-3) \cdot (-3) \cdot (-3)$

Example 3

Write $\frac{1}{6^5}$ as an expression using a negative exponent.

$\frac{1}{6^5} = 6^{-5}$ Definition of negative exponent

Example 4

Simplify. Express using positive exponents.

a. $x^{-3} \cdot x^5$

$x^{-3} \cdot x^5 = x^{(-3)+5}$ Product of Powers

$= x^2$ Add the exponents.

b. $\frac{w^{-5}}{w^{-7}}$

$\frac{w^{-5}}{w^{-7}} = w^{-5-(-7)}$ Quotient of Powers

$= w^2$ Subtract the exponents.

Exercises

Write each expression using a positive exponent.

1. a^{-8}
2. 6^{-3}
3. n^{-4}

Evaluate each expression.

4. 7^{-2}
5. 9^{-3}
6. $(-2)^{-5}$

Write each fraction as an expression using a negative exponent.

7. $\frac{1}{5^7}$
8. $\frac{1}{3^6}$
9. $\frac{1}{x^8}$

Simplify. Express using positive exponents.

10. $4^{-2} \cdot 4^{-4}$
11. $r^{-3} \cdot r^5$
12. $\frac{h^{-2}}{h^4}$

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Lesson 5 Skills Practice

Negative Exponents

Write each expression using a positive exponent.

1. 4^{-5} **2.** 5^{-7} **3.** m^{-9} **4.** s^{-6}

5. f^{-3} **6.** $(-2)^{-6}$ **7.** $(-4)^{-3}$ **8.** w^{-12}

Evaluate each expression.

9. $(-5)^{-5}$ **10.** 3^{-2} **11.** 8^{-3} **12.** $(-9)^{-4}$

Write each fraction as an expression using a negative exponent.

13. $\frac{1}{12^3}$ **14.** $\frac{1}{81}$ **15.** $\frac{1}{t^6}$ **16.** $\frac{1}{8^8}$

Simplify. Express using positive exponents.

17. $2^{-6} \cdot 2^3$ **18.** $s^{-5} \cdot s^7$ **19.** $\frac{m^8}{m^{-4}}$ **20.** $\frac{10^8}{10^9}$

21. $y^{-3} \cdot y^3$ **22.** $s^{-5} \cdot s^7$ **23.** $\frac{x^6}{x^{-3}}$ **24.** $\frac{6^{-4}}{6^8}$

25. $\frac{3^{-5}}{3^{-3}}$ **26.** $\frac{e^{-3}}{e^{-2}}$ **27.** $\frac{n^{-6}}{n^4}$ **28.** $\frac{j^{-2}}{j^{-2}}$