

Lesson Notes

5.6

NAME _____

Module 5 Decimal Operations, Exponents, and Powers
Lesson 6 Powers and Exponents

Lesson Objectives

- Use factors of numbers to introduce exponents and powers.
- Demonstrate an understanding of exponents and powers and an understanding of when to use exponents and powers in expressions.
- Define negative exponents.
- Solve problems with exponents and powers.

Subtopic 1 Exponents and Powers

- An _____ is a number that tells how many times a _____ is used as a factor.
- 4 is used as a factor _____ times, so 4 to the 3rd power is written as _____.
- A _____ is a number raised to an exponent.
- In $4^3 = 64$, 4 is the _____ and 3 is the _____.
- A negative number raised to a positive odd power has a _____ value.
- A negative number raised to a positive even power has a _____ value.

1 Write in exponential form.

$$(-6) \times (-6) \times (-6) \times (-6) \times (-6)$$

2 Evaluate 7^3 .

3 Evaluate 2 to the 6th power.

Subtopic 2 Using Exponents and Powers in Expressions

Evaluate each expression.

★ 4 $(-4)^2 \times (-3)^3$

★ 5 $2(9 - 6)^2$

★ 6 $3^3 - 2^3$

Subtopic 3 Zero and Negative Exponents

- Any nonzero number raised to the zero power equals ____.
- $b^0 = \underline{\hspace{1cm}}$ ($b \neq \underline{\hspace{1cm}}$)
- Any nonzero number raised to a negative power is the same as one over the number raised to the _____ power.
- $b^{-n} = \frac{1}{\underline{\hspace{1cm}}}$ ($b \neq \underline{\hspace{1cm}}$)

Evaluate each expression.

★ 7 3^{-4}

★ 8 $2^6 \times 8^0$

Subtopic 4 Solving Problems with Exponents and Powers

- ★ 9 Computer memory can be measured in bits, bytes, or kilobytes. There are 2^3 bits in a byte and 2^{10} bytes in a kilobyte. How many bits are there in a kilobyte?

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Irma won a math contest. On the first day she received \$4. Then, for each day after the first day, she received double the preceding day's amount. How much money did Irma receive on the fifth day?