

LEMBAR KERJA PESERTA DIDIK

Topic : Exponents and Logarithms
 Sub-topic : Properties of Exponents
 Class : X-...
 Identity :

.....

ACTIVITY 1 Discovering and identifying the concept and formal form of exponent numbers.

From the viruses problem, what can you conclude?

$$\begin{array}{lcl}
 \text{1st phase} & = 2 = 2^1 & \\
 \text{2nd phase} & = 2 \times 2 = \dots & \\
 \text{3rd phase} & = \dots \times \dots \times \dots = \dots & \\
 \dots\text{th phase} & = \dots \times \dots \times \dots \times \dots = \dots & \\
 n\text{-th phase} & = \dots \times \dots \times \dots \times \dots \times \dots \times \dots \times \dots = \dots & \\
 & \underbrace{\hspace{10em}} & \\
 & 2 \text{ as } n &
 \end{array}$$

The form above represents the repeated multiplication of the number 2, which is called exponents of 2.

In general, the repeated multiplication of a number x is called exponents of

ACTIVITY 2 Zero exponent property

1. What are the values of the exponent numbers below?

$$\begin{array}{lllll}
 \text{a. } 2^5 = \dots & 2^4 = \dots & 2^3 = \dots & 2^2 = \dots & 2^1 = \dots \\
 \text{b. } 3^5 = \dots & 3^4 = \dots & 3^3 = \dots & 3^2 = \dots & 3^1 = \dots
 \end{array}$$

2. Can you find a pattern in the answers to question number 1? Explain it.

$$\begin{array}{ll}
 \text{3. a. } 2^0 = \dots & \text{b. } 3^0 = \dots
 \end{array}$$

Can the pattern you found be used to calculate the values of the exponent numbers above? Why?

4. Write down the conclusion obtained from the zero exponent property!

ACTIVITY 3 Product and Quotient of Power Properties

1. Product of Power Property

Complete the table below.

Operasi Perkalian pada Perpangkatan	Operasi Perkalian	Perpangkatan
$6^3 \times 6^2$		
$4,2^2 \times 4,2^3$		
$7^4 \times 7^4$		
$\left(\frac{1}{3}\right)^2 \times \left(\frac{1}{3}\right)^5$		
$\left(-\frac{1}{3}\right)^3 \times \left(-\frac{1}{3}\right)^4$		
$5^3 \times 5^3$		

After completing the table above, what information do you obtain about the multiplication operation in exponents?

Simplify the multiplication operation in exponent with base a below.

$$a^m \times a^n = a^{\dots + \dots}$$

Does the rule you obtained apply to multiplication operations in exponentiation with different bases? For example, $5^4 \times 2^3$. Explain your answer.

2. Quotient of Power Property

Observe the table below!

Pembagian Bentuk Perpangkatan	Pengulangan Bentuk Perkalian	Bentuk Perpangkatan
$\frac{3^9}{3^4}$	$\frac{3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3}{3 \times 3 \times 3 \times 3}$	3^5
$\frac{(-2)^6}{(-2)^3}$	$\frac{(-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2)}{(-2) \times (-2) \times (-2)}$	$(-2)^3$
$\frac{6^8}{6^4}$	$\frac{6 \times 6 \times 6 \times 6 \times 6 \times 6 \times 6 \times 6}{6 \times 6 \times 6 \times 6}$	6^4

After observing the table above, complete the table below.

Pembagian pada Perpangkatan	Bentuk Perkalian Berulang	Perpangkatan
$\frac{4,2^{10}}{4,2^5}$		
$\frac{(-7)^7}{(-7)^5}$		
$\frac{2^7}{2^1}$		

In general, $\frac{a^m}{a^n}$ can be stated as:

$$\frac{a^m}{a^n} = a^{\dots - \dots}$$