

**CLASS 8**  
**MATHEMATICS**  
**CHAPTER: EXPONENTS AND POWERS**

**LAWS OF EXPONENTS**

<b><u>LAWS</u></b>	<b><u>EXAMPLES</u></b>
$(a^m) \times (a^n) = a^{(m+n)}$	$2^3 \times 2^2 = 2^{(3+2)} = 2^5$
$(a^m) \div (a^n) = a^{(m-n)}$	$2^3 \div 2^2 = 2^{(3-2)} = 2^1$
$(a^m)^n = a^{(m \times n)}$	$(2^3)^2 = 2^{(3 \times 2)} = 2^6$
$a^n \times b^n = (a \times b)^n$	$2^2 \times 3^2 = (2 \times 3)^2 = 6^2$
$a^n \div b^n = (a/b)^n$	$4^2 \div 2^2 = (4/2)^2 = 2^2$
$a^0 = 1$	$2^0 = 1$
$a^{(-n)} = 1/a^n$	$2^{-2} = 1/2^2 = 1/4$

1. **Simplify & write the answer in the exponential form**

$$\begin{aligned} (-4)^{-3} \times 5^{-3} \times (-5)^{-3} &= (-4 \times 5 \times -5)^{-3} \\ &= 100^{-3} = 1/100^3 \text{Ans} \end{aligned}$$

2. **Find the value of  $(3^0 + 4^{-1}) \times 2^2$**

$$\begin{aligned} (3^0 + 4^{-1}) \times 2^2 &= (1 + 1/4) \times 4 = (5/4) \times 4 \\ &= 5 \text{Ans} \end{aligned}$$

3. **Simplify :**

$$\begin{aligned} (5^{-1} \times 2^{-1}) \div 6^{-1} &= (1/5 \times 1/2) \div 1/6 \\ &= (1/10) \times 6 = 3/5 \text{Ans} \end{aligned}$$

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## SCIENTIFIC NOTATION

- $0.1 = 1/10 = 10^{-1}$

- $0.001 = 1/1000 = 10^{-3}$

- $450 = 45 \times 10 = [(45/10) \times 10] \times 10$   
 $= 4.5 \times 10 \times 10$   
 $= 4.5 \times 10^2$

- $0.00052 = 52/100000 = 52/10^5 = [(52/10) \times 10]/10^5$   
 $= (5.2 \times 10)/10^5 = 5.2 \times (10/10^5) = 5.2 \times (1/10^4)$   
 $5.2 \times (10^{-4})$

### Home work

1. Simplify and write the answer in the exponential form

(i)  $(2^5 \div 2^8)^5 \times 2^{-5}$

(ii)  $[1/2^3]^2$

2. Write the following numbers using scientific notation

2500, 0.8, 0.0027

**(Practice all the examples in the text book)**