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Class: VIII

Mathematics

Exponents and Powers

1. Find the multiplicative inverse of the following

a)  $3^{-4}$     b)  $7^{-2}$     c)  $9^{-9}$     d)  $10^{-80}$

2. Expand the following numbers using exponents

a) 18964.63    b) 7064.373

3. Simplify and write in exponential form

a)  $(-3)^{-3} \times (-3)^{-2} \times (-3)^{-5}$

b)  $a^{-8} \times a^{10} \times a^{-2}$     (c)  $(2^3 \times 2^6 \times 2^2) \div 2^{-6}$

4. Express  $9^{-3}$  as a power with the base 3.

5. Find the value of:

a)  $\left[ \left(\frac{1}{2}\right)^0 + \left(\frac{1}{5}\right)^3 + \left(\frac{2}{3}\right)^2 \right]$

b)  $\left[ \left(\frac{1}{3}\right)^{-2} - \left(\frac{1}{2}\right)^{-3} \right] \div \left(\frac{1}{4}\right)^{-2}$

c)  $\left(\frac{9}{5}\right)^{-8} \times \left(\frac{5}{9}\right)^{-5}$     d)  $(9^2 - 4^3) \times \left(\frac{-3}{17}\right)^2 \times \frac{34}{9}$

6. Simplify:  $\left[ \left(\frac{1}{4}\right)^4 \times \left(\frac{1}{4}\right)^3 \right] \times \left[ \left(\frac{3}{5}\right)^{12} \div \left(\frac{3}{5}\right)^5 \right]$

7. Find x, if  $\left(\frac{2}{3}\right)^{-5} \times \left(\frac{2}{3}\right)^{12} = \left(\frac{2}{3}\right)^{3x-2}$

8. Simplify:  $\left(\frac{a}{b}\right)^4 \times \left(\frac{4ab}{3a}\right)^2 \times \left(\frac{b}{2a}\right)^3$

9. Evaluate: (a)  $\frac{4^{-\frac{1}{2}} \times 2^{\frac{1}{2}} \times 2}{8 \times 8^{-\frac{1}{2}}}$     (b)  $\frac{(48)^{-2} \times (64)^{\frac{1}{2}}}{(24)^{-1}}$

10. Write the following in standard form:

a) 0.0000389    b) 19280000    c)  $\frac{0.000462}{10^7}$

11. Express the following numbers in usual form

a)  $2.08 \times 10^{-5}$     b)  $381624 \times 10^6$     c)  $9 \times 10^{-7}$

12. Simplify:  $\left(\frac{2}{3}\right)^3 \times \left(\frac{2}{3}\right)^{-2} \left[ \left(\frac{1}{2}\right)^2 \right]^{-2} \times \frac{1}{24}$

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**CHAPTER – 2 - EXPONENTS**

Choose the correct option (Question No. 1 – 5)

Q.1  $\left(\frac{1}{2}\right)^4 \times \left(\frac{2}{3}\right)^3$  is

- (a)  $\frac{2^3}{6^7}$  (b)  $\left(\frac{2}{6}\right)^{12}$  (c)  $\left(\frac{2}{5}\right)^7$  (d)  $\frac{1}{2 \times 3^3}$

Q.2 Multiplicative increase of  $5^{-3}$  is

- (a)  $\left(\frac{1}{5}\right)^{-3}$  (b)  $5^3$  (c)  $\left(-\frac{1}{5}\right)^{-3}$  (d)  $-5^{-3}$

Q.3 Which of the following is true

- (a)  $15^0 < 7^0$  (b)  $15^0 < 7^0$  (c)  $15^0 = 7^0$  (d)  $15^0 = 7$

Q.4 Which of the following is a false statement?

- (a)  $a^m \div a^{-n} = a^{m+n}$  (b)  $a^m \times b^m = ab^m$   
(c)  $a^{-m} \times a^n = a^{-m-n}$  (d)  $a^{-m} \times a^n = a^{-mn}$

Q.5  $4^{-3}$  in exponential form with base 2 is

- (a)  $2^6$  (b)  $2^3$  (c)  $(-2)^6$  (d)  $2^{-6}$

Q.6 (a) Express with positive exponents

- (i)  $3^{-5}$  (ii)  $5^{-6}$  (iii)  $\left(\frac{-6}{5}\right)^{-11}$

(b) In the similar manner, we can also convert negative attitude into positive attitude by using

- (i) Body (ii) Mind (iii) Intellect (iv) Gun

Choose the correct option

Q.7 Find the value.

- (a)  $-3^{-2}$  (b)  $4^{-2}$  (c)  $100^{-1}$  (d)  $-1^{-27}$  (e)  $\left(\frac{1}{3}\right)^{-5}$

Q.8 Express as a rational number.

- (a)  $5^{-1}$  (b)  $5^{-2}$  (c)  $\left(-\frac{3}{4}\right)^{-3}$  (d)  $4^3 \times 4^{-5}$  (e)  $\left[\left(\frac{3}{2}\right)^{-2}\right]^2$

Q.9 Evaluate

- (a)  $3^{-7} \div 3^{-10} \times 3^{-5}$  (b)  $3^0 - 4^0 + 3^0$  (c)  $(4^{-1} \times 3^1) \div 6^{-1}$   
(d)  $\left(\frac{2}{3}\right)^{-3} \times \left(\frac{-2}{3}\right)^{-2} \div \left(\frac{-2}{3}\right)^5$  (e)  $\left(\frac{-5}{8}\right)^7 \div \left(\frac{-5}{8}\right)^7$

Q.10 Simplify and write the answer with positive exponents.

- (a)  $(5^{-1} \div 3^{-1})^2$  (b)  $(4^{-1} \div 7^{-1})^{-1} \div (3^{-1} \div 7^{-1})^{-1}$  (c)  $\left[\left(\frac{1}{3}\right)^{-3} - \left(\frac{1}{2}\right)^{-3}\right] \div \left(\frac{1}{4}\right)^{-2}$

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Q.11 Simplify.

(a)  $5^7 \times 3^3 \div 5^{10}$

(b)  $-8^5 \div -8^5$

(c)  $\left(-\frac{3}{4}\right)^4 \times \left(-\frac{3}{4}\right)^5 \div \left(-\frac{3}{4}\right)^9$

(d)  $2^3 \cdot 5 \div 2^{15}$

Q.12 If  $x = \left(\frac{5}{4}\right)^5 \div \left(\frac{5}{4}\right)^3$  find  $x^2$

Q.13 Find 'x' if

(a)  $3^{x-2} \div 3^{-3} = 3^4$

(b)  $5^{2x+1} = 125$

(c)  $(-2)^{x+1} \times (-2)^5 = (-2)^7$

(d)  $\left(\frac{2}{5}\right)^3 \times \left(\frac{2}{5}\right)^{-6} = \left(\frac{2}{5}\right)^{2x-1}$

Q.14 By what number should  $\left(\frac{-3}{2}\right)^{-1}$  be divided so that the quotient may be equal to  $\frac{1}{6}$ .

Q.15 By what number should

(a)  $7^4$  be multiplied so that the result is 7?

(b)  $\left(\frac{-2}{9}\right)^{-2}$  be divided to get 3?

Q.16 Simplify.

(a)  $\frac{5^2 \times p^{-4}}{5^3 \times 10 \times p^{-8}}$  ( $p \neq 0$ )

(b)  $\frac{10^{-5} \times 125 \times 3^{-5}}{6^{-5} \times 5^7}$

(c)  $\frac{27 \times x^{-2}}{3^{-2} \times x^{-8}}$  ( $x \neq 0$ )

Q.17 Express in standard form

(a)  $243 \times 10^5$

(b) 0.0009

(c) Fifty Thousand

Q.18 Express in usual form

(a)  $5.4 \times 10^3$

(b)  $8 \times 10^{-2}$

(c)  $5.08 \times 10^4$

Q.19 Simplify  $\frac{1}{1+x^{-n}} + \frac{1}{1+x^n}$

Q.20  $6^{2x+1} \div 26 = 216$  (Find the value of x)