

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