



## Exercise 2.1

1. Evaluate:

$$(i) \left(\frac{3}{5}\right)^{-2}$$

$$(ii) (-3)^{-3}$$

$$(iii) \left(\frac{2}{7}\right)^{-4}$$

2. Simplify:

$$(i) [(2)^{-1} + (4)^{-1} + (3)^{-1}]^{-1}$$

$$(ii) [(4)^{-1} - (5)^{-1}]^2 \times \left(\frac{5}{8}\right)^{-1}$$

$$(iii) [4^0 + 4^2 - 2^3] \times 3^{-2}$$

$$(iv) \left[ (5)^2 - \left(\frac{1}{4}\right)^{-2} \right] \times \left(\frac{3}{4}\right)^{-2}$$

3. Find the multiplicative inverse of the following:

$$(i) \left(\frac{81}{16}\right)^{\frac{-3}{4}}$$

$$(ii) \left\{ \left(\frac{-3}{2}\right)^{-4} \right\}^{\frac{1}{2}}$$

$$(iii) \left(\frac{5}{7}\right)^{-2} \times \left(\frac{5}{7}\right)^4 \div \left(\frac{5}{7}\right)^3$$

4. (i) Express  $16^{-2}$  as a power with base 2.

(ii) Express  $125^{-4}$  as a power with base 5.

5. Write the following numbers in expanded form using exponents:

$$(i) 2789.453$$

$$(ii) 3007.805$$

6. Simplify and write in exponential form with positive exponent:

$$(i) \left[ \left\{ \left(\frac{5}{7}\right)^2 \right\}^{-1} \right]^3$$

$$(ii) \left(\frac{2}{7}\right)^2 \times \left(\frac{7}{2}\right)^{-3} \div \left\{ \left(\frac{7}{5}\right)^{-2} \right\}^{-4}$$

$$(iii) \left(\frac{4}{5}\right)^2 \times 5^4 \times \left(\frac{2}{5}\right)^{-2} \div \left(\frac{5}{2}\right)^{-3}$$

$$(iv) \frac{8^{-1} \times 5^3}{2^{-4}}$$

7. Simplify and write the following in exponential form :

$$(i) ((-2)^3)^2 + 5^{-3} \div 5^{-5} - \left(-\frac{1}{2}\right)^0$$

$$(ii) 3^{-5} \times 3^2 \div 3^{-6} + (2^2 \times 3)^2 + \left(\frac{2}{3}\right)^{-1} + 2^{-1} + \left(\frac{1}{19}\right)^{-4}$$

8. Simplify and write in exponential form with negative exponent:

$$(i) 5^3 \times \left(\frac{4}{5}\right)^3$$

$$(ii) \left[ \left(\frac{3}{7}\right)^{-2} \right]^3$$

$$(iii) \left(\frac{5}{9}\right)^{-2} \times \left(\frac{5}{3}\right)^2 \div \left(\frac{1}{5}\right)^{-2}$$

$$(iv) 2^{-1} \left[ \left(\frac{5}{3}\right)^4 + \left(\frac{3}{5}\right)^{-2} \right] \div \frac{17}{9}$$

$$(v) (-7)^3 \times \left(\frac{1}{-7}\right)^{-9} \div (-7)^{10}$$

9. Simplify:

$$(i) \frac{49 \times z^{-3}}{7^{-3} \times 10 \times z^{-5}} \quad (z \neq 0)$$

$$(ii) \frac{9^3 \times 27 \times t^4}{(3)^2 \times (3)^4 \times t^2}$$

$$(iii) \frac{(3^{-2})^2 \times (5^2)^{-3} \times (t^{-3})^2}{(3^{-2})^5 \times (5^3)^{-2} \times (t^{-4})^3}$$

$$(iv) \frac{2^{-5} \times 15^{-5} \times 500}{5^{-6} \times 6^{-5}}$$

10. By what number should  $\left(\frac{3}{-2}\right)^{-3}$  be divided to get  $\left(\frac{2}{3}\right)^2$ ?

11. Find the value of  $m$  for which  $9^m \div 3^{-2} = 9^4$ .

12. If  $\left(\frac{-5}{7}\right)^{-4} \times \left(\frac{-5}{7}\right)^{12} = \left\{\left(\frac{-5}{7}\right)^3\right\}^x \times \left(\frac{-5}{7}\right)^{-1}$ , find the value of  $x$ .

13. Find  $x$  if  $\left(\frac{-2}{3}\right)^{-13} \times \left(\frac{3}{-2}\right)^8 = \left(\frac{-2}{3}\right)^{-2x+1}$ .

14. (i) If  $5^{2x-1} = \frac{1}{(125)^{x-3}}$ , find  $x$ .

(ii) If  $\frac{9^n \times 3^5 \times (27)^3}{3 \times (81)^4} = 27$ , find  $n$ .