

EXERCISE 12.1

1. Evaluate.

(i) 3^{-2}

(ii) $(-4)^{-2}$

(iii) $\left(\frac{1}{2}\right)^{-5}$

2. Simplify and express the result in power notation with positive exponent.

(i) $(-4)^5 (-4)^8$

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

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

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

(v) $2^{-3} \times (-7)^{-3}$

3. Find the value of

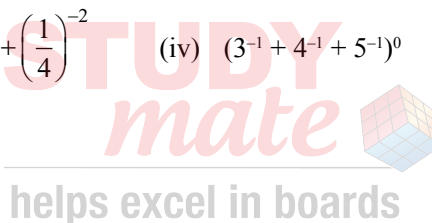
(i) $(3^0 + 4^{-1}) \times 2^2$

(ii) $(2^{-1} \times 4^{-1}) \div 2^{-2}$

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

(iv) $(3^{-1} + 4^{-1} + 5^{-1})^0$

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



4. Evaluate:

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

(ii) $(5^{-1} \times 2^{-1}) \times 6^{-1}$

5. Find the value of m for which $5^m \div 5^{-3} = 5^5$.

6. Evaluate:

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

(ii) $\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-4}$

7. Simplify.

(i) $\frac{25 \times 5^{-4}}{5^{-3} \times 10 \times t^{-8}} (t \neq 0)$

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

TEST YOURSELF (EP-1)

1. Evaluate:

(a) 10^{-1}

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

(c) $\left(\frac{3}{7}\right)^{-6}$

2. Solve:

(i) $(2^{-1} + 3^{-1} + 4^{-1})^0$

(ii) $\left(\frac{3}{7}\right)^{-6} \times \left(\frac{7}{3}\right)^{-5}$

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

(iv) $(3^0 + 1^0) \times (2^0 \times 1^0)$

(v) $(4^{-1} - 5^{-1}) \div 3^{-1}$

3. Find the value of x .

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

(b) $x \times (-5)^4 \div x^2 = 5$

4. Simplify the following rational numbers

(i) $\left[\left(-\frac{8}{13}\right)^{-1} \div \left(\frac{16}{5}\right)^{-1}\right] \div \left(\frac{4}{5}\right)^{-1}$

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

(iii) $\frac{12^4 \times 9^3 \times 4}{6^3 \times 8^2 \times 27}$

(iv) $\frac{25 \times 5^2 \times x^6}{10^3 \times x^3}$

5. Express in power notation.

(a) $\frac{256}{6561}$

(b) $\frac{-1}{3125}$

(c) $\frac{1}{64}$

(d) $\frac{49}{9}$

(e) $5 \times 5 \times 7 \times 7 \times 7 \times 6 \times 6$

(f) $(-14) \times (-14) \times (-14) \times (-14)$

(g) $2 \times 2 \times x \times x \times 3 \times 3 \times a \times a^3$

6. Find the multiplicative inverse of the following:

(i) 5^{-2}

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

EXERCISE 12.2

1. Express the following numbers in standard form.

(i) 0.00000000000085

(ii) 0.000000000000942

(iii) 6020000000000000

(iv) 0.00000000837

(v) 31860000000

2. Express the following numbers in usual form.

(i) 3.02×10^{-6}	(ii) 4.5×10^4
(iii) 3×10^{-8}	(iv) 1.001×10^9
(v) 5.8×10^{12}	(vi) 3.61492×10^6
3. Express the number appearing in the following statements in standard form.
 - (i) 1 micron is equal to $\frac{1}{1000000}$ m
 - (ii) Charge of an electron is 0.000,000,000,000,000,16 coulomb.
 - (iii) Size of a bacteria is 0.0000005 m
 - (iv) Size of a plant cell is 0.00001275 m
 - (v) Thickness of a thick paper is 0.07 mm
4. Evaluate:
 In a stack there are 5 books each of thickness 20 mm and 5 paper sheets each of thickness 0.016 mm. What is the total thickness of the stack.

TEST YOURSELF (EP-2)

1. Write the following numbers in standard form.

(a) 0.000000564	(b) 5240000
(c) 2706.27	(d) 60,000,000,000
(e) 3,380,000,000,000,000,000	
2. Express the following numbers in usual form.

(i) 3.9×10^6	(ii) 3×10^{-5}
(iii) 9.871×10^{-4}	(iv) 1.54×10^{-4}
3. The size of a blue tablet is 0.00005 m and of a red tablet is 0.0000175 m. Compare their sizes and find their ratios.
4. The distance travelled by a ray of light in one year is $T = 9.4605 \times 10^{15}$ m. Express T in expanded form.

