

Access answers to Maths NCERT Solutions for Class 7 Chapter 13 – Exponents and Powers Exercise 13.3

1. Write the following numbers in the expanded forms:

279404

Solution:-

The expanded form of the number 279404 is,

$$= (2 \times 100000) + (7 \times 10000) + (9 \times 1000) + (4 \times 100) + (0 \times 10) + (4 \times 1)$$

Now we can express it using powers of 10 in the exponent form,

$$= (2 \times 10^5) + (7 \times 10^4) + (9 \times 10^3) + (4 \times 10^2) + (0 \times 10^1) + (4 \times 10^0)$$

3006194

Solution:-

The expanded form of the number 3006194 is,

$$= (3 \times 1000000) + (0 \times 100000) + (0 \times 10000) + (6 \times 1000) + (1 \times 100) + (9 \times 10) + 4$$

Now we can express it using powers of 10 in the exponent form,

$$= (3 \times 10^6) + (0 \times 10^5) + (0 \times 10^4) + (6 \times 10^3) + (1 \times 10^2) + (9 \times 10^1) + (4 \times 10^0)$$

2806196

Solution:-

The expanded form of the number 2806196 is,

$$= (2 \times 1000000) + (8 \times 100000) + (0 \times 10000) + (6 \times 1000) + (1 \times 100) + (9 \times 10) + 6$$

Now we can express it using powers of 10 in the exponent form,

$$= (2 \times 10^6) + (8 \times 10^5) + (0 \times 10^4) + (6 \times 10^3) + (1 \times 10^2) + (9 \times 10^1) + (6 \times 10^0)$$

120719

Solution:-

The expanded form of the number 120719 is,

$$= (1 \times 100000) + (2 \times 10000) + (0 \times 1000) + (7 \times 100) + (1 \times 10) + (9 \times 1)$$

Now we can express it using powers of 10 in the exponent form,

$$= (1 \times 10^5) + (2 \times 10^4) + (0 \times 10^3) + (7 \times 10^2) + (1 \times 10^1) + (9 \times 10^0)$$

20068

Solution:-

The expanded form of the number 20068 is,

$$= (2 \times 10000) + (0 \times 1000) + (0 \times 100) + (6 \times 10) + (8 \times 1)$$

Now we can express it using powers of 10 in the exponent form,

$$= (2 \times 10^4) + (0 \times 10^3) + (0 \times 10^2) + (6 \times 10^1) + (8 \times 10^0)$$

2. Find the number from each of the following expanded forms:

(a) $(8 \times 10)^4 + (6 \times 10)^3 + (0 \times 10)^2 + (4 \times 10)^1 + (5 \times 10)^0$

Solution:-

The expanded form is,

$$= (8 \times 10000) + (6 \times 1000) + (0 \times 100) + (4 \times 10) + (5 \times 1)$$

$$= 80000 + 6000 + 0 + 40 + 5$$

$$= 86045$$

(b) $(4 \times 10)^5 + (5 \times 10)^3 + (3 \times 10)^2 + (2 \times 10)^0$

Solution:-

The expanded form is,

$$\begin{aligned} &= (4 \times 100000) + (0 \times 10000) + (5 \times 1000) + (3 \times 100) + (0 \times 10) + (2 \times 1) \\ &= 400000 + 0 + 5000 + 300 + 0 + 2 \\ &= 405302 \end{aligned}$$

(c) $(3 \times 10)^4 + (7 \times 10)^2 + (5 \times 10)^0$

Solution:-

The expanded form is,

$$\begin{aligned} &= (3 \times 10000) + (0 \times 1000) + (7 \times 100) + (0 \times 10) + (5 \times 1) \\ &= 30000 + 0 + 700 + 0 + 5 \\ &= 30705 \end{aligned}$$

(d) $(9 \times 10)^5 + (2 \times 10)^2 + (3 \times 10)^1$

Solution:-

The expanded form is,

$$\begin{aligned} &= (9 \times 100000) + (0 \times 10000) + (0 \times 1000) + (2 \times 100) + (3 \times 10) + (0 \times 1) \\ &= 900000 + 0 + 0 + 200 + 30 + 0 \\ &= 900230 \end{aligned}$$

3. Express the following numbers in standard form:

(i) 5,00,00,000

Solution:-

The standard form of the given number is 5×10^7

(ii) 70,00,000

Solution:-

The standard form of the given number is 7×10^6

(iii) 3,18,65,00,000

Solution:-

The standard form of the given number is 3.1865×10^9

(iv) 3,90,878

Solution:-

The standard form of the given number is 3.90878×10^5

(v) 39087.8

Solution:-

The standard form of the given number is 3.90878×10^4

(vi) 3908.78

Solution:-

The standard form of the given number is 3.90878×10^3

4. Express the number appearing in the following statements in standard form.

(a) The distance between Earth and Moon is 384,000,000 m.

Solution:-

The standard form of the number appearing in the given statement is 3.84×10^8 m.

(b) Speed of light in vacuum is 300,000,000 m/s.

Solution:-

The standard form of the number appearing in the given statement is 3×10^8 m/s.

(c) Diameter of the Earth is 1,27,56,000 m.

Solution:-

The standard form of the number appearing in the given statement is $1.2756 \times 10^7 \text{ m}$.

(d) Diameter of the Sun is 1,400,000,000 m.

Solution:-

The standard form of the number appearing in the given statement is $1.4 \times 10^9 \text{ m}$.

(e) In a galaxy there are on an average 100,000,000,000 stars.

Solution:-

The standard form of the number appearing in the given statement is 1×10^{11} stars.

(f) The universe is estimated to be about 12,000,000,000 years old.

Solution:-

The standard form of the number appearing in the given statement is 1.2×10^{10} years old.

(g) The distance of the Sun from the centre of the Milky Way Galaxy is estimated to be 300,000,000,000,000,000 m.

Solution:-

The standard form of the number appearing in the given statement is $3 \times 10^{20} \text{ m}$.

(h) 60,230,000,000,000,000,000,000 molecules are contained in a drop of water weighing 1.8 gm.

Solution:-

The standard form of the number appearing in the given statement is 6.023×10^{22} molecules.

(i) The earth has 1,353,000,000 cubic km of sea water.

Solution:-

The standard form of the number appearing in the given statement is 1.353×10^9 cubic km.

(j) The population of India was about 1,027,000,000 in March, 2001.

Solution:-

The standard form of the number appearing in the given statement is 1.027×10^9 .