

EXERCISE 13.3**PAGE: 263****1. Write the following numbers in the expanded forms:****(a) 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,

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

(b) 3006194**Solution:-**

The expanded form of the number 3006194 is,

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

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

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

(c) 2806196**Solution:-**

The expanded form of the number 2806196 is,

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

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

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

(d) 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,

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

(e) 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,

$$= (4 \times 100000) + (0 \times 10000) + (5 \times 1000) + (3 \times 100) + (0 \times 10) + (2 \times 1)$$

$$= 400000 + 0 + 5000 + 300 + 0 + 2$$

$$= 405302$$

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

Solution:-

The expanded form is,

$$= (3 \times 10000) + (0 \times 1000) + (7 \times 100) + (0 \times 10) + (5 \times 1)$$

$$= 30000 + 0 + 700 + 0 + 5$$

$$= 30705$$

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

Solution:-

The expanded form is,

$$= (9 \times 100000) + (0 \times 10000) + (0 \times 1000) + (2 \times 100) + (3 \times 10) + (0 \times 1)$$

$$= 900000 + 0 + 0 + 200 + 30 + 0$$

$$= 900230$$

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 a 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 1.2756×10^7 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 1.4×10^9 m.

(e) In a galaxy, there are, on 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 3×10^{20} m.

(h) 60,230,000,000,000,000,000 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 seawater.

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 .

