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NCERT Solutions for Class 7 Maths Chapter 13 PDF

Below is the PDF link for NCERT Solutions for Class 7 Maths Chapter 13. This PDF provides detailed solutions to the exercises and problems presented in the chapter. By using this resource students can enhance their understanding of Exponents and Powers and practice solving various types of questions. Utilizing the PDF will aid students in strengthening their mathematical skills and preparing effectively for examinations.

NCERT Solutions for Class 7 Maths Chapter 13 PDF

NCERT Solutions for Class 7 Maths Chapter 13 PDF Exponents and Powers

Exercise 13.1 Page: 252

1. Find the value of:

(i) 2^6

Solution:-

The above value can be written as,

= 2 × 2 × 2 × 2 × 2 × 2

= 64

220

(ii) 9^3

Solution:-

The above value can be written as,

= 9 × 9 × 9

= 729

(iii) 11^2

Solution:-

The above value can be written as,

= 11 × 11

= 121

88

(iv) 5^4

Solution:-

The above value can be written as,

= 5 × 5 × 5 × 5

= 625

2. Express the following in exponential form:

(i) 6 × 6 × 6 × 6

Solution:-

The given question can be expressed in the exponential form as 6^4.

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(ii) t × t

Solution:-

The given question can be expressed in the exponential form as t^2.

(iii) b × b × b × b

Solution:-

The given question can be expressed in the exponential form as b^4.

(iv) 5 × 5× 7 × 7 × 7

Solution:-

The given question can be expressed in the exponential form as $5^2 \times 7^3$.

(v) 2 × 2 × a × a

Solution:-

The given question can be expressed in the exponential form as $2^2 \times a^2$.

(vi) a × a × a × c × c × c × c × d

Solution:-

The given question can be expressed in the exponential form as $a^3 \times c^4 \times d$.

3. Express each of the following numbers using the exponential notation:

(i) 512

Solution:-

The factors of 512 = 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2

So it can be expressed in the exponential form as 2^9.

(ii) 343

Solution:-

The factors of 343 = 7 × 7 × 7

So it can be expressed in the exponential form as 7^3.

(iii) 729

Solution:-

The factors of 729 = 3 × 3 × 3 × 3 × 3 × 3

So it can be expressed in the exponential form as 3^6.

(iv) 3125

Solution:-

The factors of 3125 = 5 × 5 × 5 × 5 × 5

So it can be expressed in the exponential form as 5^5.

4. Identify the greater number, wherever possible, in each of the following.

(i) 4^3 or 3^4

Solution:-

The expansion of $4^3 = 4 \times 4 \times 4 = 64$

The expansion of $3^4 = 3 \times 3 \times 3 \times 3 = 81$

Clearly,

$64 < 81$

So, $4^3 < 3^4$

Hence, 3^4 is the greater number.

(ii) 5^3 or 3^5

Solution:-

The expansion of $5^3 = 5 \times 5 \times 5 = 125$

The expansion of $3^5 = 3 \times 3 \times 3 \times 3 \times 3= 243$

Clearly,

$125 < 243$

So, $5^3 < 3^5$

Hence, 3^5 is the greater number.

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(iii) 2^8 or 8^2

Solution:-

The expansion of $2^8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256$

The expansion of $8^2 = 8 \times 8= 64$

Clearly,

$256 > 64$

So, $2^8 > 8^2$

Hence, 2^8 is the greater number.

(iv) 100^2 or 2^{100}

Solution:-

The expansion of $100^2 = 100 \times 100 = 10000$

The expansion of 2^{100}

$2^{10} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 1024$

Then,

$2^{100} = 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 = (1024)^{10}$

Clearly,

$100^2 < 2^{100}$

Hence, 2^{100} is the greater number.

(v) 2^{10} or 10^2

Solution:-

The expansion of $2^{10} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 1024$

The expansion of $10^2 = 10 \times 10 = 100$

Clearly,

$1024 > 100$

So, $2^{10} > 10^2$

Hence, 2^{10} is the greater number.

5. Express each of the following as a product of powers of their prime factors:

(i) 648

Solution:-

Factors of 648 = 2 × 2 × 2 × 3 × 3 × 3 × 3

= $2^3 \times 3^4$

(ii) 405

Solution:-

Factors of 405 = 3 × 3 × 3 × 3 × 5

= $3^4 \times 5$

(iii) 540

Solution:-

Factors of 540 = 2 × 2 × 3 × 3 × 3 × 5

= $2^2 \times 3^3 \times 5$

(iv) 3,600

Solution:-

Factors of 3600 = 2 × 2 × 2 × 2 × 3 × 3 × 5 × 5

= $2^4 \times 3^2 \times 5^2$

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6. Simplify:

(i) 2×10^3

Solution:-

The above question can be written as,

= 2 × 10 × 10 × 10

= 2 × 1000

= 2000

(ii) $7^2 \times 2^2$

Solution:-

The above question can be written as,

$= 7 \times 7 \times 2 \times 2$

$= 49 \times 4$

$= 196$

(iii) $2^3 \times 5$

Solution:-

The above question can be written as,

$= 2 \times 2 \times 2 \times 5$

$= 8 \times 5$

$= 40$

(iv) 3×4^4

Solution:-

The above question can be written as,

$= 3 \times 4 \times 4 \times 4 \times 4$

$= 3 \times 256$

$= 768$

(v) 0×10^2

Solution:-

The above question can be written as,

$= 0 \times 10 \times 10$

$= 0 \times 100$

$= 0$

(vi) $5^2 \times 3^3$

Solution:-

The above question can be written as,

$= 5 \times 5 \times 3 \times 3 \times 3$

$= 25 \times 27$

$= 675$

(vii) $2^4 \times 3^2$

Solution:-

The above question can be written as,

$= 2 \times 2 \times 2 \times 2 \times 3 \times 3$

$= 16 \times 9$

$= 144$

(viii) $3^2 \times 10^4$

Solution:-

The above question can be written as,

$= 3 \times 3 \times 10 \times 10 \times 10 \times 10$

$= 9 \times 10000$

$= 90000$

7. Simplify:

(i) $(-4)^3$

Solution:-

The expansion of -4^3

$= -4 \times -4 \times -4$

$= -64$

(ii) $(-3) \times (-2)^3$

Solution:-

The expansion of (-3) × $(-2)^3$

= – 3 × – 2 × – 2 × – 2

= – 3 × – 8

= 24

(iii) $(–3)^2 × (–5)^2$

Solution:-

The expansion of $(-3)^2 × (-5)^2$

= – 3 × – 3 × – 5 × – 5

= 9 × 25

= 225

(iv) $(–2)^3 × (–10)^3$

Solution:-

The expansion of $(-2)^3 × (-10)^3$

= – 2 × – 2 × – 2 × – 10 × – 10 × – 10

= – 8 × – 1000

= 8000

614

8. Compare the following numbers:

(i) $2.7 × 10^{12}$; $1.5 × 10^8$

Solution:-

By observing the question

Comparing the exponents of base 10,

Clearly,

$2.7 × 10^{12} > 1.5 × 10^8$

(ii) 4×10^{14} ; 3×10^{17}

Solution:-

By observing the question

Comparing the exponents of base 10,

Clearly,

$4 \times 10^{14} < 3 \times 10^{17}$

Exercise 13.2 Page: 260

1. Using laws of exponents, simplify and write the answer in exponential form:

(i) $3^2 \times 3^4 \times 3^8$

Solution:-

By the rule of multiplying the powers with the same base = $a^m \times a^n = a^{m+n}$

Then,

$= (3)^{2+4+8}$

$= 3^{14}$

(ii) $6^{15} \div 6^{10}$

Solution:-

By the rule of dividing the powers with the same base = $a^m \div a^n = a^{m-n}$

Then,

$= (6)^{15-10}$

$= 6^5$

(iii) $a^3 \times a^2$

Solution:-

By the rule of multiplying the powers with the same base = $a^m \times a^n = a^{m+n}$

Then,

$= (a)^{3 + 2}$

$= a^5$

(iv) $7^x \times 7^2$

Solution:-

By the rule of multiplying the powers with the same base = $a^m \times a^n = a^{m + n}$

Then,

$= (7)^{x + 2}$

(v) $(5^2)^3 \div 5^3$

Solution:-

By the rule of taking the power of as power = $(a^m)^n = a^{mn}$

$(5^2)^3$ can be written as = $(5)^{2 \times 3}$

$= 5^6$

Now, $5^6 \div 5^3$

By the rule of dividing the powers with the same base = $a^m \div a^n = a^{m - n}$

Then,

$= (5)^{6 - 3}$

$= 5^3$

(vi) $2^5 \times 5^5$

Solution:-

By the rule of multiplying the powers with the same exponents = $a^m \times b^m = ab^m$

Then,

$= (2 \times 5)^5$

$= 10^5$

(vii) $a^4 \times b^4$

Solution:-

By the rule of multiplying the powers with the same exponents = $a^m \times b^m = ab^m$

Then,

= $(a \times b)^4$

= ab^4

(viii) $(3^4)^3$

Solution:-

By the rule of taking the power of as power = $(a^m)^n = a^{mn}$

$(3^4)^3$ can be written as = $(3)^{4 \times 3}$

= 3^{12}

(ix) $(2^{20} \div 2^{15}) \times 2^3$

Solution:-

By the rule of dividing the powers with the same base = $a^m \div a^n = a^{m-n}$

$(2^{20} \div 2^{15})$ can be simplified as,

= $(2)^{20-15}$

= 2^5

Then,

By the rule of multiplying the powers with the same base = $a^m \times a^n = a^{m+n}$

$2^5 \times 2^3$ can be simplified as,

= $(2)^{5+3}$

= 2^8

(x) $8^t \div 8^2$

Solution:-

By the rule of dividing the powers with the same base = $a^m \div a^n = a^{m-n}$

Then,

$= (8)^{t-2}$

2. Simplify and express each of the following in exponential form:

(i) $(2^3 \times 3^4 \times 4) / (3 \times 32)$

Solution:-

Factors of 32 = 2 × 2 × 2 × 2 × 2

$= 2^5$

Factors of 4 = 2 × 2

$= 2^2$

Then,

$= (2^3 \times 3^4 \times 2^2) / (3 \times 2^5)$

$= (2^{3+2} \times 3^4) / (3 \times 2^5)$ … [$\because a^m \times a^n = a^{m+n}$]

$= (2^5 \times 3^4) / (3 \times 2^5)$

$= 2^{5-5} \times 3^{4-1}$ … [$\because a^m \div a^n = a^{m-n}$]

$= 2^0 \times 3^3$

$= 1 \times 3^3$

$= 3^3$

(ii) $((5^2)^3 \times 5^4) \div 5^7$

Solution:-

$(5^2)^3$ can be written as $= (5)^{2 \times 3}$ … [$\because (a^m)^n = a^{mn}$]

$= 5^6$

Then,

$= (5^6 \times 5^4) \div 5^7$

$= (5^{6+4}) \div 5^7$ … [$\because a^m \times a^n = a^{m+n}$]

$= 5^{10} \div 5^{7}$

$= 5^{10-7}$ … [$\because a^m \div a^n = a^{m-n}$]

$= 5^{3}$

(iii) $25^4 \div 5^3$

Solution:-

$(25)^4$ can be written as $= (5 \times 5)^4$

$= (5^2)^4$

$(5^2)^4$ can be written as $= (5)^{2 \times 4}$ … [$\because (a^m)^n = a^{mn}$]

$= 5^{8}$

Then,

$= 5^8 \div 5^3$

$= 5^{8-3}$ … [$\because a^m \div a^n = a^{m-n}$]

$= 5^5$

(iv) $(3 \times 7^2 \times 11^8)/ (21 \times 11^3)$

Solution:-

Factors of 21 = 7 × 3

Then,

$= (3 \times 7^2 \times 11^8)/ (7 \times 3 \times 11^3)$

$= 3^{1-1} \times 7^{2-1} \times 11^{8-3}$

$= 3^0 \times 7 \times 11^5$

$= 1 \times 7 \times 11^5$

$= 7 \times 11^5$

(v) $3^7/ (3^4 \times 3^3)$

Solution:-

$= 3^7 / (3^{4+3})$ … [$\because a^m \times a^n = a^{m+n}$]

$= 3^7 / 3^7$

$= 3^{7-7}$ … [$\because a^m \div a^n = a^{m-n}$]

$= 3^0$

= 1

(vi) $2^0 + 3^0 + 4^0$

Solution:-

= 1 + 1 + 1

= 3

(vii) $2^0 \times 3^0 \times 4^0$

Solution:-

= 1 × 1 × 1

= 1

(viii) $(3^0 + 2^0) \times 5^0$

Solution:-

= (1 + 1) × 1

= (2) × 1

= 2

(ix) $(2^8 \times a^5) / (4^3 \times a^3)$

Solution:-

$(4)^3$ can be written as $= (2 \times 2)^3$

$= (2^2)^3$

$(2^2)^3$ can be written as $= (2)^{2 \times 3}$ … [$\because (a^m)^n = a^{mn}$]

$= 2^6$

Then,

= $(2^8 \times a^5)/ (2^6 \times a^3)$

= $2^{8-6} \times a^{5-3}$ … [∵ $a^m \div a^n = a^{m-n}$]

= $2^2 \times a^2$ … [∵ $(a^m)^n = a^{mn}$]

= $2a^2$

(x) $(a^5/a^3) \times a^8$

Solution:-

= $(a^{5-3}) \times a^8$ … [∵ $a^m \div a^n = a^{m-n}$]

= $a^2 \times a^8$

= a^{2+8} … [∵ $a^m \times a^n = a^{m+n}$]

= a^{10}

(xi) $(4^5 \times a^8b^3)/ (4^5 \times a^5b^2)$

Solution:-

= $4^{5-5} \times (a^{8-5} \times b^{3-2})$ … [∵ $a^m \div a^n = a^{m-n}$]

= $4^0 \times (a^3b)$

= $1 \times a^3b$

= a^3b

(xii) $(2^3 \times 2)^2$

Solution:-

= $(2^{3+1})^2$ … [∵ $a^m \times a^n = a^{m+n}$]

= $(2^4)^2$

$(2^4)^2$ can be written as = $(2)^{4 \times 2}$ … [∵ $(a^m)^n = a^{mn}$]

= 2^8

3. Say true or false and justify your answer:

(i) $10 \times 10^{11} = 100^{11}$

Solution:-

Let us consider Left Hand Side (LHS) = 10×10^{11}

= $10^{1 + 11}$ … [∵ $a^m \times a^n = a^{m + n}$]

= 10^{12}

Now, consider Right Hand Side (RHS) = 100^{11}

= $(10 \times 10)^{11}$

= $(10^{1 + 1})^{11}$

= $(10^2)^{11}$

= $(10)^{2 \times 11}$ … [∵ $(a^m)^n = a^{mn}$]

= 10^{22}

By comparing LHS and RHS,

LHS ≠ RHS

Hence, the given statement is false.

(ii) $2^3 > 5^2$

Solution:-

Let us consider LHS = 2^3

Expansion of $2^3 = 2 \times 2 \times 2$

= 8

Now, consider RHS = 5^2

Expansion of $5^2 = 5 \times 5$

= 25

By comparing LHS and RHS,

LHS < RHS

$2^3 < 5^2$

Hence, the given statement is false.

(iii) $2^3 \times 3^2 = 6^5$

Solution:-

Let us consider LHS = $2^3 \times 3^2$

Expansion of $2^3 \times 3^2 = 2 \times 2 \times 2 \times 3 \times 3$

= 72

Now, consider RHS = 6^5

Expansion of $6^5 = 6 \times 6 \times 6 \times 6 \times 6$

= 7776

By comparing LHS and RHS,

$72 \neq 7776$

LHS ≠ RHS

Hence, the given statement is false.

(iv) $3^0 = (1000)^0$

Solution:-

Let us consider LHS = 3^0

= 1

Now, consider RHS = 1000^0

= 1

By comparing LHS and RHS,

LHS = RHS

$3^0 = 1000^0$

Hence, the given statement is true.

4. Express each of the following as a product of prime factors only in exponential form:

(i) 108 × 192

Solution:-

The factors of 108 = 2 × 2 × 3 × 3 × 3

= $2^2 \times 3^3$

The factors of 192 = 2 × 2 × 2 × 2 × 2 × 2 × 3

= $2^6 \times 3$

Then,

= $(2^2 \times 3^3) \times (2^6 \times 3)$

= $2^{2+6} \times 3^{3+1}$ … [$\because a^m \times a^n = a^{m+n}$]

= $2^8 \times 3^4$

(ii) 270

Solution:-

The factors of 270 = 2 × 3 × 3 × 3 × 5

= $2 \times 3^3 \times 5$

(iii) 729 × 64

The factors of 729 = 3 × 3 × 3 × 3 × 3 × 3

= 3^6

The factors of 64 = 2 × 2 × 2 × 2 × 2 × 2

= 2^6

Then,

= $(3^6 \times 2^6)$

= $3^6 \times 2^6$

(iv) 768

Solution:-

The factors of 768 = 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 3

= $2^8 \times 3$

5. Simplify:

(i) $((2^5)^2 \times 7^3)/ (8^3 \times 7)$

Solution:-

8^3 can be written as = $(2 \times 2 \times 2)^3$

= $(2^3)^3$

We have,

= $((2^5)^2 \times 7^3)/ ((2^3)^3 \times 7)$

= $(2^{5 \times 2} \times 7^3)/ ((2^{3 \times 3} \times 7)$ … [∵ $(a^m)^n = a^{mn}$]

= $(2^{10} \times 7^3)/ (2^9 \times 7)$

= $(2^{10-9} \times 7^{3-1})$ … [∵ $a^m \div a^n = a^{m-n}$]

= 2×7^2

= 2 × 7 × 7

= 98

(ii) $(25 \times 5^2 \times t^8)/ (10^3 \times t^4)$

Solution:-

25 can be written as = 5 × 5

= 5^2

10^3 can be written as = 10^3

= $(5 \times 2)^3$

= $5^3 \times 2^3$

We have,

$= (5^2 \times 5^2 \times t^8)/ (5^3 \times 2^3 \times t^4)$

$= (5^{2+2} \times t^8)/ (5^3 \times 2^3 \times t^4)$ … [$\because a^m \times a^n = a^{m+n}$]

$= (5^4 \times t^8)/ (5^3 \times 2^3 \times t^4)$

$= (5^{4-3} \times t^{8-4})/ 2^3$ … [$\because a^m \div a^n = a^{m-n}$]

$= (5 \times t^4)/ (2 \times 2 \times 2)$

$= (5t^4)/ 8$

(iii) $(3^5 \times 10^5 \times 25)/ (5^7 \times 6^5)$

Solution:-

10^5 can be written as $= (5 \times 2)^5$

$= 5^5 \times 2^5$

25 can be written as $= 5 \times 5$

$= 5^2$

6^5 can be written as $= (2 \times 3)^5$

$= 2^5 \times 3^5$

Then we have,

$= (3^5 \times 5^5 \times 2^5 \times 5^2)/ (5^7 \times 2^5 \times 3^5)$

$= (3^5 \times 5^{5+2} \times 2^5)/ (5^7 \times 2^5 \times 3^5)$ … [$\because a^m \times a^n = a^{m+n}$]

$= (3^5 \times 5^7 \times 2^5)/ (5^7 \times 2^5 \times 3^5)$

$= (3^{5-5} \times 5^{7-7} \times 2^{5-5})$

$= (3^0 \times 5^0 \times 2^0)$ … [$\because a^m \div a^n = a^{m-n}$]

$= 1 \times 1 \times 1$

$= 1$

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 × 100000) + (7 × 10000) + (9 × 1000) + (4 × 100) + (0 × 10) + (4 × 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 × 1000000) + (0 × 100000) + (0 × 10000) + (6 × 1000) + (1 × 100) + (9 × 10) + (4 × 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 × 1000000) + (8 × 100000) + (0 × 10000) + (6 × 1000) + (1 × 100) + (9 × 10) + (6 × 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 × 100000) + (2 × 10000) + (0 × 1000) + (7 × 100) + (1 × 10) + (9 × 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 × 10000) + (0 × 1000) + (0 × 100) + (6 × 10) + (8 × 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 × 10000) + (6 × 1000) + (0 × 100) + (4 × 10) + (5 × 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 × 100000) + (0 × 10000) + (5 × 1000) + (3 × 100) + (0 × 10) + (2 × 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 × 10000) + (0 × 1000) + (7 × 100) + (0 × 10) + (5 × 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 × 100000) + (0 × 10000) + (0 × 1000) + (2 × 100) + (3 × 10) + (0 × 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 3.84×10^8m.

(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 3×10^8m/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 1.2756×10^7m.

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

Solution:-

The standard form of the number appearing in the given statement is 1.4×10^9m.

(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.

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

Solution:-

The standard form of the number appearing in the given statement is 3×10^{20}m.

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