



# NCERT Solutions for 7th Class Maths: Chapter 13-Exponents and Powers



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## NCERT Solutions for 7th Class Maths: Chapter 13-Exponents and Powers

Class 7: Maths Chapter 13 solutions. Complete Class 7 Maths Chapter 13 Notes.

### NCERT Solutions for 7th Class Maths: Chapter 13-Exponents and Powers

NCERT 7th Maths Chapter 13, class 7 Maths Chapter 13 solutions

#### Exercise 13.1

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**1. Find the value of:**

(i)  $2^6$

(ii)  $9^3$

(iii)  $11^2$

(iv)  $5^4$

**Answer**

(i)  $2^6 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$

(ii)  $9^3 = 9 \times 9 \times 9 = 729$

(iii)  $11^2 = 11 \times 11 = 121$

(iv)  $5^4 = 5 \times 5 \times 5 \times 5 = 625$

**2. Express the following in exponential form:**

(i)  $t \times t$

(ii)  $6 \times 6 \times 6 \times 6$

(iii)  $b \times b \times b \times b$

(iv)  $5 \times 5 \times 7 \times 7 \times 7$

(v)  $2 \times 2 \times a \times a$

(vi)  $a \times a \times a \times c \times c \times c \times c \times d$

**Answer**

(i)  $6 \times 6 \times 6 \times 6 = 6^4$

(ii)  $t \times t = t^2$

(iii)  $b \times b \times b \times b = b^4$

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

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(v)  $2 \times 2 \times a \times a = 2^2 \times a^2$

(vi)  $a \times a \times a \times c \times c \times c \times c \times d = a^3 \times c^4 \times d$

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

**(i) 512**

**(ii) 343**

**(iii) 729**

**(iv) 3125**

**Answer**

(i) 512

$$512 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^9$$

$$2^{512}$$

$$2^{256}$$

$$2^{128}$$

$$2^{64}$$

$$2^{32}$$

$$2^{16}$$

$$2^8$$

$$2^4$$

$$2^2$$

$$1$$

(ii) 343

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$$343 = 7 \times 7 \times 7 = 7^3$$

(iii) 729

$$729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 3^6$$

$$\begin{array}{r} 72 \\ 3 \ 9 \end{array}$$

$$\begin{array}{r} 24 \\ 3 \ 3 \end{array}$$

$$\begin{array}{r} 81 \\ 3 \end{array}$$

$$\begin{array}{r} 27 \\ 3 \end{array}$$

$$\begin{array}{r} 9 \\ 3 \end{array}$$

$$\begin{array}{r} 3 \\ 3 \end{array}$$

$$1$$

(iv) 3125

$$3125 = 5 \times 5 \times 5 \times 5 \times 5 = 5^5$$

$$\begin{array}{r} 312 \\ 5 \ 5 \end{array}$$

$$\begin{array}{r} 625 \\ 5 \end{array}$$

$$\begin{array}{r} 125 \\ 5 \end{array}$$

$$\begin{array}{r} 25 \\ 5 \end{array}$$

$$\begin{array}{r} 5 \\ 5 \end{array}$$

$$1$$

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

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(i)  $4^3$  and 34

(ii)  $5^3$  or 35

(iii)  $2^8$  or 82

(iv)  $100^2$  or 2100

(v)  $2^{10}$  or 102

**Answer**

(i)  $4^3 = 4 \times 4 \times 4 = 64$

$34 = 3 \times 3 \times 3 \times 3 = 81$

Since  $64 < 81$

Thus, 34 is greater than 43.

(ii)  $5^3 = 5 \times 5 \times 5 = 125$

$3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$

Since,  $125 < 243$

Thus, 34 is greater than 53.

(iii)  $2^8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256$

$8^2 = 8 \times 8 = 64$

Since,  $256 > 64$

Thus, 28 is greater than 82.

(iv)  $100^2 = 100 \times 100 = 10,000$

$2^{100} = 2 \times 2 \times 2 \times 2 \times 2 \dots 14 \text{ times } \dots \times 2 = 16,384 \dots \times 2$

Since,  $10,000 < 16,384 \dots \times 2$

Thus, 2100 is greater than 1002.

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$$(v) 2^{10} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 1,024$$

$$10^2 = 10 \times 10 = 100$$

Since,  $1,024 > 100$

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

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

**(i) 648**

**(ii) 405**

**(iii) 540**

**(iv) 3,600**

**Answer**

$$(i) 648 = 2^3 \times 3^4$$

$$2 \quad \begin{matrix} 64 \\ 8 \end{matrix}$$

$$2 \quad \begin{matrix} 32 \\ 4 \end{matrix}$$

$$2 \quad \begin{matrix} 16 \\ 2 \end{matrix}$$

$$3 \quad 81$$

$$3 \quad 27$$

$$3 \quad 9$$

$$3 \quad 3$$

$$1$$

$$(ii) 405 = 5 \times 3^4$$

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$$5 \frac{40}{5}$$

$$3 \frac{81}{3}$$

$$3 \frac{27}{3}$$

$$3 \frac{9}{3}$$

$$3 \frac{3}{3}$$

$$1$$

(iii)  $540 = 2^2 \times 3^3 \times 5$

$$2 \frac{54}{2}$$

$$2 \frac{27}{2}$$

$$3 \frac{13}{5}$$

$$3 \frac{45}{3}$$

$$3 \frac{15}{3}$$

$$5 \frac{5}{5}$$

$$1$$

(iv)  $3,600 = 2^4 \times 3^2 \times 5^2$

$$2 \frac{360}{2}$$

$$2 \frac{180}{2}$$

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$$2 \quad 900$$

$$2 \quad 450$$

$$3 \quad 225$$

$$3 \quad 75$$

$$5 \quad 25$$

$$5 \quad 5$$

$$1$$

**6. Simplify:**

(i)  $2 \times 10^3$

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

(iii)  $2^3 \times 5$

(iv)  $3 \times 4^4$

(v)  $0 \times 10^2$

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

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

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

**Answer**

(i)  $2 \times 10^3 = 2 \times 10 \times 10 \times 10 = 2,000$

(ii)  $7^2 \times 2^2 = 7 \times 7 \times 2 \times 2 = 196$

(iii)  $2^3 \times 5 = 2 \times 2 \times 2 \times 5 = 40$

(iv)  $3 \times 4^4 = 3 \times 4 \times 4 \times 4 \times 4 = 768$

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(v)  $0 \times 10^2 = 0 \times 10 \times 10 = 0$

(vi)  $5^3 \times 3^3 = 5 \times 5 \times 5 \times 3 \times 3 \times 3 = 675$

(vii)  $2^4 \times 3^2 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$

(viii)  $3^2 \times 10^4 = 3 \times 3 \times 10 \times 10 \times 10 \times 10 = 90,000$

### 7. Simplify:

(i)  $(-4)^3$

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

(iii)  $(-3)^2 \times (-5)^2$

(iv)  $(-2)^3 \times (-10)^3$

### Answer

(i)  $(-4)^3 = (-4) \times (-4) \times (-4) = -64$

(ii)  $(-3) \times (-2)^3 = (-3) \times (-2) \times (-2) \times (-2) = 24$

(iii)  $(-3)^2 \times (-5)^2 = (-3) \times (-3) \times (-5) \times (-5) = 225$

(iv)  $(-2)^3 \times (-10)^3 = (-2) \times (-2) \times (-2) \times (-10) \times (-10) \times (-10)$

### 8. Compare the following numbers:

(i)  $2.7 \times 10^{12}$ ;  $1.5 \times 10^8$

(ii)  $4 \times 10^{14}$ ;  $3 \times 10^{17}$

### Answer

(i)  $2.7 \times 10^{12}$  and  $1.5 \times 10^8$

On comparing the exponents of base 10,

$$2.7 \times 10^{12} > 1.5 \times 10^8$$

(ii)  $4 \times 10^{14}$  and  $3 \times 10^{17}$

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On comparing the exponents of base 10,

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

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

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

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

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

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

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

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

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

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

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

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

**Answer**

(i)  $3^2 \times 3^4 \times 3^8 = 3^{(2+4+8)} = 3^{14}$  [ $\because a^m \times a^n = a^{m+n}$ ]

(ii)  $6^{15} \div 6^{10} = 6^{15-10} = 6^5$  [ $\because a^m \div a^n = a^{m-n}$ ]

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

(iv)  $7^x \times 7^2 = 7^{x+2}$  [ $\because a^m \times a^n = a^{m+n}$ ]

(v)  $(5^2)^2 \div 5^3 = 5^{2 \times 2} \div 5^3 = 5^4 \div 5^3$  [ $\because (a^m)^n = a^{m \times n}$ ]

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

(vi)  $2^5 \times 2^5 = (2 \times 2)^5 = 10^5$  [ $\because a^m \times b^m = (a \times b)^m$ ]

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$$(vii) a^4 \times b^4 = (a \times b)^4 \text{ [}\therefore a^m \times b^m = (a \times b)^m\text{]}$$

$$(viii) (3^4)^3 = 3^{4 \times 3} = 3^{12} \text{ [}\therefore (a^m)^n = a^{m \times n}\text{]}$$

$$(ix) (2^{20} \div 2^{15}) \times 2^3 = (2^{20-15}) \times 2^3 \text{ [}\therefore a^m \div a^n = a^{m-n}\text{]}$$

$$= 2^5 \times 2^3 = 2^{5+3} = 2^8 \text{ [}\therefore a^m \times a^n = a^{m+n}\text{]}$$

$$(x) 8^1 \div 8^2 = 8^{1-2} \text{ [}\therefore a^m \div a^n = a^{m-n}\text{]}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

**Answer**

$$(i) 2^3 \times 3^4 \times 4 / 3 \times 32 = 2^3 \times 3^4 \times 2^2 / 3 \times 2^5 = 2^{3+2} \times 3^4 / 3 \times 2^5 \text{ [}\therefore a^m \times a^n = a^{m+n}\text{]}$$

$$= 2^5 \times 3^4 / 3 \times 2^5 = 2^{5-5} \times 3^{4-3} \text{ [}\therefore a^m \div a^n = a^{m-n}\text{]}$$

$$= 2^0 \times 3^3 = 1 \times 3^3 = 3^3$$

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$$(ii) [(5^2)^3 \times 5^4] \div 5^7 \quad [\because (a^m)^n = a^{m \times n}]$$

$$= [5^{6+4}] \div 5^7 = 5^{10} \div 5^7 \quad [\because a^m \times a^n = a^{m+n}]$$

$$= 5^{10-7} = 5^3 \quad [\because a^m \div a^n = a^{m-n}]$$

$$(iii) 25^4 \div 5^3 = (5^2)^4 \div 5^3 = 5^8 \div 5^3 \quad [\because (a^m)^n = a^{m \times n}]$$

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

$$(iv) 3 \times 7^2 \times 11^8 / 21 \times 11^2 = 3 \times 7^2 \times 11^8 / 3 \times 7 \times 11^3 = 3^{1-1} \times 7^{2-1} \times 11^{8-3} \quad [\because a^m \div a^n = a^{m-n}]$$

$$= 3^0 \times 7^1 \times 11^5 = 7 \times 11^5$$

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

$$= 3^{7-7} = 3^0 = 1 \quad [\because a^m \times a^n = a^{m+n}]$$

$$(vi) 2^0 + 3^0 + 4^0 + 1+1+1 = 3 \quad [\because a^0 = 1]$$

$$(vii) 2^0 \times 3^0 \times 4^0 = 1 \times 1 \times 1 = 1 \quad [\because a^0 = 1]$$

$$(viii) (3^0 + 2^0) \times 5^0 = (1+1) \times 1 = 2 \times 1 = 2 \quad [\because a^0 = 1]$$

$$(ix) 2^8 \times a^5 / 4^3 \times a^3 = 2^8 \times a^5 / (2^2)^3 \times a^3 = 2^8 \times a^5 / 2^6 \times a^3 \quad [\because (a^m)^n = a^{m \times n}]$$

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

$$= (2a)^2 \quad [\because a^m \times b^m = (a \times b)^m]$$

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

$$= a^{2+8} = a^{10} \quad [\because a^m \times a^n = a^{m+n}]$$

$$(xi) 4^5 \times a^8 b^3 / 4^5 \times a^5 b^2 = 4^{5-5} \times a^{8-5} \times b^{3-2} = 4^0 \times a^3 \times b \quad [\because a^m \div a^n = a^{m-n}]$$

$$= 1 \times a^3 \times b = a^3 b \quad [\because a^0 = 1]$$

$$(xii) (2^3 \times 2)^2 = (2^{3+1})^2 = (2^4)^2 \quad [\because a^m \times a^n = a^{m+n}]$$

$$= 2^{4 \times 2} = 2^8$$

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**3. Say true or false and justify your answer:**

(i)  $10 \times 10^{11} = 10011$

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

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

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

**Answer**

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

L.H.S.  $10^{1+11} = 10^{12}$  and R.H.S.  $(10^2)^{11} = 10^{22}$

Since, L.H.S.  $\neq$  R.H.S.

Therefore, it is false.

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

L.H.S.  $2^3 = 8$  and R.H.S.  $5^2 = 25$

Since, L.H.S. is not greater than R.H.S.

Therefore, it is false,

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

L.H.S.  $2^3 \times 3^2 = 8 \times 9 = 72$  and R.H.S.  $6^5 = 7.776$

Since, L.H.S.  $\neq$  R.H.S.

Therefore, it is false.

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

L.H.S.  $3^0 = 1$  and R.H.S.  $(1000)^0 = 1$

Since, L.H.S. = R.H.S.

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Therefore, it is true.

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

(i)  $108 \times 192$

(ii) 270

(iii)  $729 \times 64$

(iv) 768

**Answer**

(i)  $108 \times 192$

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

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

$$= 2^{6+2} \times 3^{3+1} \quad (a^m \times a^n = a^{m+n})$$

$$= 2^8 \times 3^4$$

(ii)  $270 = 2 \times 3 \times 3 \times 3 \times 5 = 2 \times 3^3 \times 5$

(iii)  $729 \times 64 = (3 \times 3 \times 3 \times 3 \times 3 \times 3) \times (2 \times 2 \times 2 \times 2 \times 2)$

$$= 3^6 \times 2^5$$

(iv)  $768 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 = 2^8 \times 3$

**5. Simplify:**

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

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

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

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**Answer**

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

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

$$= 2^{10-9} \times 7^{3-1}$$

$$= 2 \times 7^2$$

$$= 2 \times 49$$

$$= 98$$

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

$$= 5^{2+2} \times t^{8-4} / 2^3 \times 5^3$$

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

$$= 5^{4-3} \times t^4 / 2^3$$

$$= 5t^4 / 8$$

$$(iii) 3^5 \times 10^5 \times 25 / 5^7 \times 6^5 = 3^5 \times (2 \times 5)^5 \times 5^2 / 5^7 \times (2 \times 3)^5$$

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

$$= 3^5 \times 2^5 \times 5^{5+2} / 5^7 \times 2^5 \times 3^5$$

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

$$= 2^{5-5} \times 3^{5-5} \times 5^{5-5}$$

$$= 2^0 \times 3^0 \times 5^0$$

$$= 1 \times 1 \times 1$$

$$= 1$$

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**1. Write the following numbers in the expanded form:**

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(i) 279404

(ii) 3006194

(iii) 2806196

(iv) 120719

(v) 20068

**Answer**

(i) 2,79,404

$$= 2,00,000 + 70,000 + 9,000 + 400 + 00 + 4$$

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

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

(ii) 3006194

$$= 3000000 + 0 + 0 + 6000 + 100 + 90 + 4$$

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

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

(iii) 28,06,196

$$= 20,00,000 + 8,00,000 + 0 + 6,000 + 100 + 90 + 6$$

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

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

(iv) 1,20,719 = 1,00,000 + 20,000 + 0 + 700 + 10 + 9

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

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

(v) 20,068 = 20,000 + 00 + 00 + 60 + 8

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

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

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

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

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

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

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

**Answer**

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

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

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

$$= 86,045$$

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

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

$$= 400000 + 0 + 5000 + 3000 + 0 + 2$$

$$= 4,05,302$$

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

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

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

$$= 30,705$$

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

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

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

$$= 9,00,230$$

NCERT 7th Maths Chapter 13, class 7 Maths Chapter 13 solutions

**3. Express the following numbers in standard form:**

**(i) 5,00,00,000**

**(ii) 70,00,000**

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

**(iv) 3,90,878**

**(v) 39087.8**

**(vi) 3908.78**

**Answer**

$$(i) 5,00,00,000 = 5 \times 1,00,00,000 = 5 \times 10^7$$

$$(ii) 70,00,000 = 7 \times 10,00,000 = 7 \times 10^6$$

$$(iii) 3,18,65,00,000 = 31865 \times 100000$$

$$= 3.1865 \times 10000 \times 100000 = 3.1865 \times 10^9$$

$$(iv) 3,90,878 = 3.90878 \times 100000 = 3.90878 \times 10^5$$

$$(v) 39087.8 = 3.90878 \times 10000 = 3.90878 \times 10^4$$

$$(vi) 3908.78 = 3.90878 \times 1000 = 3.90878 \times 10^3$$

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

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

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

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

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- (d) Diameter of the Sun is 1,400,000,000 m.
- (e) In a galaxy there are on an average 100,000,000,000 stars.
- (f) The universe is estimated to be about 12,000,000,000 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.
- (h) 60,230,000,000,000,000,000 molecules are contained in a drop of water weighing 1.8 gm.
- (i) The Earth has 1,353,000,000 cubic km of sea water.
- (j) The population of India was about 1,027,000,000 in march, 2001.

### Answer

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

$$= 384 \times 1000000 \text{ m}$$

$$= 3.84 \times 100 \times 1000000$$

$$= 3.84 \times 10^8 \text{ m}$$

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

$$= 3 \times 100000000 \text{ m/s}$$

$$= 3 \times 10^8 \text{ m/s}$$

(c) Diameter of the Earth = 1,27,50,000 m

$$= 12756 \times 1000 \text{ m}$$

$$= 1.2756 \times 10000 \times 1000 \text{ m}$$

$$= 1.2756 \times 10^7 \text{ m}$$

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

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$$= 14 \times 100,000,000 \text{ m}$$

$$= 1.4 \times 10 \times 100,000,000 \text{ m}$$

$$= 1.4 \times 10^9 \text{ m}$$

(e) Average of Stars = 100, 000, 000,000

$$= 1 \times 100,000,000,000$$

$$= 1 \times 10^{11}$$

(f) Years of Universe = 12,000,000,000 years

$$= 12 \times 1000,000,000 \text{ years}$$

$$= 1.2 \times 10 \times 1000,000,000 \text{ years}$$

$$= 1.2 \times 10^{10} \text{ years}$$

(g) Distance of the Sun from the centre of the Milky Way Galaxy

$$= 300,000,000,000,000,000 \text{ m}$$

$$= 3 \times 100,000,000,000,000,000 \text{ m}$$

$$= 3 \times 10^{20} \text{ m}$$

(h) Number of molecules in a drop of water weighing 1.8 gm

$$= 60,230,000,000,000,000,000$$

$$= 6023 \times 10,000,000,000,000,000$$

$$= 6,023 \times 1000 \times 10,000,000,000,000,000$$

$$= 6.023 \times 10^{22}$$

(i) The Earth has Sea water = 1,353,000,000 km<sup>3</sup>

$$= 1,353 \times 1000000 \text{ km}^3$$

$$= 1,353 \times 1000 \times 1000,000 \text{ km}^3$$

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$$= 1.353 \times 10^9 \text{ km}^3$$

(j) The population of India = 1,027,000,000

$$= 1027 \times 1000000 = 1,027 \times 1000 \times 1000000$$

$$= 1.027 \times 10^9.$$



# Chapterwise NCERT Solutions for Class 7 Maths :

- Chapter 1 Integers
- Chapter 2 Fractions and Decimals
- Chapter 3 Data Handling
- Chapter 4 Simple Equations
- Chapter 5 Lines and Angles
- Chapter 6 The Triangle and its Properties
- Chapter 7 Congruence of Triangles
- Chapter 8 Comparing Quantities
- Chapter 9 Rational Numbers
- Chapter 10 Practical Geometry
- Chapter 11 Perimeter and Area
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