



MATHS

NCERT - NCERT Mathematics(English)

EXPONENTS AND POWERS

Exercise 13.3

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

(a)

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

,

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

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



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2. 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



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3. Write the following numbers in the expanded forms:

279404, 3006194, 2806196, 120719, 20068



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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 the Earth is 12,756,000 m.

(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 300,000,000,000,000,000,000 m.

(h)

60,230,000,000,000,000,000,000 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.



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Solved Examples

1. Write exponential form for $8 \times 8 \times 8 \times 8$ taking base as 2.

A. 2^{12}

B. 2^6

C. 2^8

D. 2^{10}

Answer: *A*



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2. Simplify and write the answer in the

exponential form. (i) $\left(\frac{3^7}{3^2}\right) \times 3^5$ (ii)

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



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3. Simplify : (i) $\frac{12^4 \times 9^3 \times 4}{6^3 \times 8^2 \times 27}$ (ii) $2^3 \times a^3 \times 5a^4$



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4. Express the following numbers in the standard form:

(i) 5985.3 (ii) 65,950 (iii) 3,430,000 (iv)

70,040,000,000



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5. Expand : (i) $\left(\frac{3}{5}\right)^4$ (ii) $\left(\frac{4}{7}\right)^5$



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6. Express the following terms in the exponential form :

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

(ii) $(2a)^4$

(iii) $(-4m)^3$





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7. Can you tell which one is greater

$$(5^2) \times 3 \text{ or } (5^2)^3 ?$$



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8. Work out

$$(1)^5, (-1)^3, (-1)^4, (-10)^3, (-5)^4$$



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9. Express the following numbers as a product of powers of prime factors: (i) 72 (ii) 432 (iii) 1000 (iv) 16000



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10. Expand . a^3b^2 , a^2b^3 , b^2a^3 , b^3a^2 Are they all same ?



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11. which one is greater 8^2 or 2^8 ?



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12. Which one is greater 2^3 or 3^2 ?



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13. Express 256 as a power 2.

A. 2^4

B. 2^6

C. 2^8

D. 2^6

Answer: *C*



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Exercise 13 1

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

(i) 4^3 or 3^4

(ii) 5^3 or 3^5

(iii) 2^8 or 8^2

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



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

(i) 648

(ii) 405

(iii) 540

(iv)

3,600



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3. Simplify : (i) 2×10^3 (ii) $7^2 \times 2^2$ (iii) $2^3 \times 5$
(iv) 3×4^4



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4. Simplify : (i) $(-4)^3$ (ii) $(-3) \times (-2)^3$ (iii)
 $(-3)^2 \times (-5)^2$ (iv) $(-2)^3 \times (-10)^3$



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5. Find the value of : (i) 2^6 (ii) 9^3 (iii) 11^2 (iv) 5^4



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6. Express the following in exponential form : (i)

$6 \times 6 \times 6 \times 6$ (ii) $t \times t$ (iii) $b \times b \times b \times b$



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7. Express each of the following numbers using

exponential notation:(i) 512 (ii) 343

(iii) 729 (iv) 3125



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8. Compare the following numbers :

(i) 27×10^{12} , 15×10^8

(ii) 4×10^{14} , 3×10^{17}



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Exercise 13 2

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

$3^2 \times 3^4 \times 3^8$ (ii) $\frac{6^{15}}{6^{10}}$



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2. Say true or false and justify your answer :

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

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

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



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3. Simplify and express each of the following in

exponential form: (i) $\frac{2^3 \times 3^4 \times 4}{3 \times 32}$ (ii)

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



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4. Simplify: (i) $\frac{(2^5)2 \times 7^3}{8^3 \times 7}$ (ii) $\frac{25 \times 5^2 \times t^8}{10^3 \times t^4}$



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5. Express each of the following as a product of prime factors only in exponential form: (i) 108×192 (ii) 270 (iii) 729×64 (iv) 768



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