



# MATHS

## BOOKS - SUBHASH PUBLICATION

### EXPONENTS AND POWERS

#### Example

1. Find the value of :  $2^6$



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2. Find the value of :  $9^3$



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3. Find the value of :  $11^2$



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4. Find the value of :  $5^4$



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5. Express the following in exponential form:

$6 \times 6 \times 6 \times 6$



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6. Express the following in exponential form:

$t \times t$



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7. Express the following in exponential form:

$$b \times b \times b \times b$$



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8. Express the following in exponential form:

$$5 \times 5 \times 7 \times 7 \times 7$$



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9. Express the following in exponential form:

$$2x^2xaxa$$



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10. Express the following in exponential form: a

$$xaxaxcxcxcd$$



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**11.** Express each of the following numbers using exponential notation: 512



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**12.** Express each of the following numbers using exponential notation: 343



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**13.** Express each of the following numbers using exponential notation: 729



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**14.** Express each of the following numbers using exponential notation: 3125



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15. Identify the greater number, wherever possible, in each of the following:  $4^3$  or  $3^4$



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16. Identify the greater number, wherever possible, in each of the following:  $5^3$  or  $3^5$



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17. Identify the greater number, wherever possible, in each of the following:  $2^8$  or  $8^2$



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18. Identify the greater number, wherever possible, in each of the following:  $100^2$  or  $2^{100}$



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**19.** Identify the greater number, wherever possible, in each of the following:  $2^{10}$  or  $10^2$



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**20.** Express each of the following as product of powers of their prime factors: 648



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**21.** Express each of the following as product of powers of their prime factors: 405



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**22.** Express each of the following as product of powers of their prime factors: 540



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**23.** Express each of the following as product of powers of their prime factors: 3,600



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**24.** Simplify:  $2 \times 10^3$



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**25.** Simplify:  $7^2 \times 2^2$



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**26.** Simplify:  $2^3 \times 5$



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**27.** Simplify:  $3 \times 4^4$



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**28.** Simplify:  $0 \times 10^2$



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**29. Simplify:**  $5^2 \times 3^3$



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**30. Simplify:**  $2^4 \times 3^2$



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**31. Simplify:**  $3^2 \times 10^4$



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**32. Simplify:**  $(-4)^3$



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**33. Simplify:**  $(-3) \times (-2)^3$



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**34. Simplify:**  $(-3)^2 \times (-5)^2$



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**35.** Simplify:  $(-2)^3 \times (-10)^3$



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**36.** Compare the following numbers:

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



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**37.** Compare the following numbers:

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





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**38.** Using laws of exponents, simplify and write the answer in exponential form:  $3^2 \times 3^4 \times 3^8$

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**39.** Using laws of exponents, simplify and write the answer in exponential form:  $6^{15} \div 6^{10}$

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**40.** Using laws of exponents, simplify and write the answer in exponential form:  $a^3 \div a^2$



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**41.** Using laws of exponents, simplify and write the answer in exponential form:  $2^6 \div 2^5$



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**42.** Using laws of exponents, simplify and write the answer in exponential form:  $b^4 \div b^4$



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**43.** Using laws of exponents, simplify and write the answer in exponential form:  $(3^4)^3$



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**44.** Using laws of exponents, simplify and write the answer in exponential form:  $8^t \times 8^2$



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**45.** Simplify and express each of the following in exponential form:  $\frac{2^3 \times 3^4 \times 4}{3 \times 32}$



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**46.** Simplify and express each of the following

in exponential form:  $\left((5^2)^3 \times 5^4\right) \div 5^7$



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**47.** Simplify and express each of the following

in exponential form:  $25^4 \div 5^3$



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**48.** Simplify and express each of the following

in exponential form:  $\frac{3 \times 7^2 \times 11^8}{21 \times 11^3}$



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**49.** Simplify and express each of the following

in exponential form:  $\frac{3^7}{3^4 \times 3^3}$



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**50.** Simplify and express each of the following in exponential form:  $2^0 + 3^0 + 4^0$



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**51.** Simplify and express each of the following in exponential form:  $2^0 \times 3^0 \times 4^0$



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**52.** Simplify and express each of the following

in exponential form:  $(3^0 + 2^0) \times 5^0$



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**53.** Simplify and express each of the following

in exponential form:  $\frac{2^8 \times a^5}{4^3 \times a^3}$



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**54.** Simplify and express each of the following

in exponential form:  $\left(\frac{a^5}{a^3}\right) \times a^8$



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**55.** Simplify and express each of the following

in exponential form:  $\frac{4^5 \times a^8 b^3}{4^5 \times a^5 b^2}$



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**56.** Simplify and express each of the following in exponential form:  $(2^3 \times 2)^2$



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

$$10 \times 10^{11} = 100^{11}$$



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

$$2^3 > 5^2$$



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

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



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

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



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

$$108 \times 192$$



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**62.** Express each of the following as a product of prime factors only in exponential form: 270



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**63.** Express each of the following as a product of prime factors only in exponential form:  
729x64



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**64.** Express each of the following as a product of prime factors only in exponential form: 768



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**65.** Simplify:  $\frac{(2^5)^2 \times 7^3}{8^3 \times 7}$



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**66.** Simplify:  $\frac{25X5^2Xt^8}{10^3Xt^4}$



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67. Simplify:  $\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5}$



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68. Write the following numbers in the expanded forms: 279404,



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**69.** Write the following numbers in the expanded forms: 3006194



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**70.** Write the following numbers in the expanded forms: 2806196



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71. Write the following numbers in the expanded forms: 120719



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72. Write the following numbers in the expanded forms: 20068



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**73.** Find the number form each of the following expanded forms:

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



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**74.** Find the number form each of the following expanded forms:

$$4 \times 10^5 + 5 \times 10^3 + 3 \times 10^2 + 2 \times 10^0$$



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**75.** Find the number form each of the following expanded forms:  $3 \times 10^4 + 7 \times 10^2 + 5 \times 10^0$



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**76.** Find the number from each of the following expanded forms:  $9 \times 10^5 + 2 \times 10^2 + 3 \times 10^1$



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**77.** Express the following numbers in standard form: 5,00,00,000



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**78.** Express the following numbers in standard form: 70,00,000



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**79.** Express the following numbers in standard form: 3,18,65,00,000



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**80.** Express the following numbers in standard form: 3908.78



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**81.** Express the number appearing in the following statements in standard form: The distance between Earth and Moon is 384,000,000 m.



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**82.** Express the number appearing in the following statements in standard form: Speed of light in vacuum is 300,000,000 m/s.



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**83.** Express the number appearing in the following statements in standard form: Diameter of the Earth is 1,27,56,000m.



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

Diameter of the Sun is 1,400,00,000m.



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**85.** Express the number appearing in the following statements in standard form: In a galaxy there are on an average 100,000,000,000 stars.



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**86.** Express the number appearing in the following statements in standard form: The universe is estimated to be about 12,000,000,000 years old.



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**87.** Express the number appearing in the following statements in standard form: The distance of the Sun from the center of the Milky Way Galaxy is estimated to be 300,000,000,000,000,000,000 m.





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

60,230,000,000,000,000,000,000 molecules are contained in a drop of water weighing 1.8gm :

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



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

60,230,000,000,000,000,000,000 molecules are contained in a drop of water weighing 1.8gm :

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



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

population of India was about 1,027,000,000 in March, 2001.



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