MATHS

BOOKS - PSEB

Exponents and Power

Example

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1. Express 256 as a power 2.

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

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3. Which one is greater 8^2 or 2^8?

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

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

72

6. Express the following numbers as a product of powers of prime factors:

432

7. Express the following numbers as a product of powers of prime factors:

1000

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8. Express the following numbers as a product of powers of prime factors:

16000

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9. Work out $(1)^5$, $(-1)^3$, $(-1)^4$, $(-10)^3$, $(-5)^4$.

10. Find the value of:

2^6

11. Find the value of:

9^3

12. Find the value of:

11^2

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13. Find the value of:

5^4

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14. Express the following in exponential form:

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

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15. Express the following in exponential form:

t × t

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16. Express the following in exponential form:

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

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17. Express the following in exponential form:

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

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18. Express the following in exponential form:

$2 \times 2 \times a \times a$

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19. Express the following in exponential form:

$a \times a \times a \times c \times c \times c \times c \times d$

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

512

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

343

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

729

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

3125

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

4 or 4^4

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

5 or 3^5

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

2 or 8^2

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

100^2 or 2^{100}

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

21^{10} or 10^2

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

648

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

540

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

3,600

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32. Simplify:

$$2 \times 10^3$$

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33. Simplify:

$$7^2 \times 2^2$$

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34. Simplify:

$2^3 \times 5$

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35. Simplify:

3×4

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36. Simplify:

$$0 \times 10^2$$

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37. Simplify:

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

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38. Simplify:

$$2^4 \times 3^2$$

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39. Simplify:

$$3 \times 10^4$$

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40. Simplify:

$$(-4)^3$$

41. Simplify:

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

42. Simplify:

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

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43. Simplify:

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

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44. Compare the following numbers

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

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45. Compare the following numbers

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

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46. Can you tell which one is greater $\left(5^2\right) \times 3$ or $\left(5^2\right)^3$?

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47. Express the following terms in the exponential form:

$(2 \times 3)^5$

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48. Express the following terms in the exponential form:

$(2a)^4$

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49. Express the following terms in the exponential form:

$(-4m)^3$

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50. Expand:

$$\left(\frac{3}{5}\right)^4$$

51. Expand:

$$\left(-\frac{4}{7}\right)^5$$

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

53. Simplify and write the answer in the exponential form.

$$\left(\frac{3^7}{3^2} \right) \times 3^5$$

54. Simplify and write the answer in the exponential form.

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

55. Simplify and write the answer in the exponential form.

$$\left(6^2 \times 6^4\right) \div 6^3$$

56. Simplify and write the answer in the exponential form.

$$\left[\left(2^2\right)^3 \times 3^6\right] \times 5^6$$

57. Simplify and write the answer in the exponential form.

$8^2 \div 2^3$

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58. Simplify:

$$\frac{12^4 \times 9^3 \times 4}{6^3 \times 8^2 \times 27}$$

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59. Simplify:

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

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60. Simplify:

$$\frac{2 \times 3^4 \times 2^5}{9 \times 4^2}$$

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

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

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

$$6^{15} 6^{10}$$

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

$$a^3 \times a^2$$

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

$$7^x \times 7^2$$

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

$$\left(5^2\right)^3 \div 5^3$$

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

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

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

$$a^4 \times b^4$$

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

$$\left(3^4\right)^3$$

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

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

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

$$8^t \div 8^2$$

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

$$\frac{2^3 \times 3^4 \times 4}{3 \times 32}$$

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

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

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

$$25^4 \div 5^3$$

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

$$\frac{3 \times 7^2 \times 11^8}{21 \times 11^3}$$

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

$$\frac{3^7}{3^4 \times 3^3}$$

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

$$2^\circ + 3^\circ + 4^\circ$$

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

$$2° + 3° + 4°$$

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

$$(3° + 2°) \times 5°$$

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

$$\frac{2^8 \times a^5}{4^3 \times a^3}$$

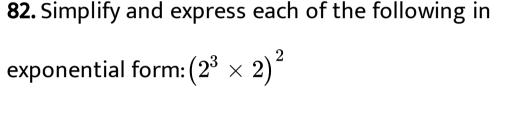**80.** Simplify and express each of the following in exponential form:

$$\left(\frac{a^5}{a^3}\right) \times a^8$$

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

$$\frac{4^5 \times a^8 b^3}{4^5 \times a^5 b^2}$$

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

83. Say true or false and justify your answer:

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

84. Say true or false and justify your answer:

$2^3 > 5^2$

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85. Say true or false and justify your answer:

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

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86. Say true or false and justify your answer:

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

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

$$108 \times 192$$

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

270

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

729×64

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

768

91. simplify:

$$\frac{\left(2^5\right)^2 \times 7^3}{8^3 \times 7}$$

92. simplify:

$$\frac{25 \times 5^2 \times t^8}{10^3 \times t^4}$$

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93. simplify:

$$\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5}$$

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94. Express the following numbers in the standard form:

5985.3

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95. Express the following numbers in the standard form:

65,950

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96. Express the following numbers in the standard form:

3,430,000

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97. Express the following numbers in the standard form:

70,040,000,000

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98. Find the number from each of the following

expanded forms:

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

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99. Find the number from each of the following

expanded forms:

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

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

$3 \times 10^4 + 7 \times 10^2 + 5 \times 10°$

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101. 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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102. Express the following numbers in standard form:

5,00,00,000

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103. Express the following numbers in standard form:

70,00,000

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104. Express the following numbers in standard form:

3,18,65,00,000

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105. Express the following numbers in standard form:

3,90,878

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106. Express the following numbers in standard form:

39087.8

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107. Express the following numbers in standard form:

3908.78

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108. 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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109. 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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110. Express the number appearing in the following statements in standard form

Diameter of the Earth is 1,27,56,000 m.

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111. Express the number appearing in the following statements in standard form

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

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112. Express the number appearing in the following statements in standard form

In a galaxy there are on an average 100,000,000,000 stars.

113. Express the number appearing in the following statements in standard form

The universe is estimated to be about 12,000,000,000 years old.

114. Express the number appearing in the following statements in standard form

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

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115. 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 1.8 gm

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116. Express the number appearing in the following statements in standard form

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

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117. 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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