MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

CUBES AND CUBE ROOTS

Others

1. Is 256 a perfect cube?

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2. Is 216 a perfect cube? What is that number whose cube is 216?

3. Is 27000 a perfect cube ? What is the number whose cube is 27000 ?

4. What is the smallest number by which 392 must be multiplied so that the product is a perfect cube?

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5. What is the smallest number by which 3087 must be divided so that the quotient is a perfect cube ?

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6. Prove that if a number is doubled, then its cube is eight times the cube of the given number.

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7. Evaluate the following : (I) $\left\{\left(24^2+7^2\right)^{\frac{1}{2}}\right\}^3$

(ii) $\left\{\sqrt{15^2+8^2}\right\}^3$

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8. Find the volume of a cube whose surface area is 150 m^2.

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9. Find the cubes of the following numbers :

(i)7 (ii) 12 16

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10. Find the cubes of the following numbers :

(i)21 (ii) 40 (iii) 55

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11. Find the cubes of the following numbers :

(i)100 (ii) 302 (iii) 301

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12. Write the cubes of all natural numbers between 1 and 10 and verify the following statements : Cubes of all odd natural numbers are odd. Cubes of all even natural numbers are even.

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13. Observe the following pattern : $1^3 = 1$

$1^3 + 2^3 = (1 + 2)^2$

$1^3 + 2^3 + 3^3 = (1 + 2 + 3)^2$

Write the next three rows and calculate the value of $1^3 + 2^3 + 3^3 + \ + \ + 9^3 + 10^3$ by the above pattern.

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14. Write the cubes of 5 natural number which are multiples of 3 and verity the followings: The cube of a natural number which is a multiple of 3 is a multiple of 27'

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15. Write the cubes of 5 natural number which are of form $3n+1(eg.\ 4, 7, 10)$ and verify the following : The cube of a natural number of the form $3n+1$ is a natural number of the same form i.e. when divided by 3 it leaves the remainder 1

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16. Write the cubes of 5 natural numbers of the form $3n+2\left(i\dot{e}.5, 8, 11, \right)$ and verify the following : The cube of a natural number of

the form $3n + 2$ is a natural number of the same form i.e. when it is dividend by 3 the remainder is 2

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17. Write the cubes of 5 natural numbers of which are multiples of 7 and verify the following : The cube of multiple of 7 is a multiple of 7^3.

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18. Which of the following are perfect cubes?

(I) 64 (ii) 216 (iii) 243

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19. Which of the following are perfect cubes?

(I) 1000 (ii) 1728 (iii) 3087

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20. Which of the following are perfect cubes ?

(I)4608 (ii) 106480 (iii)166375 (iv) 456533

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21. Which of the following are cubes of even natural numbers? 216, 512, 729, 1000, 3375, 13824

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22. Which of the following are cubes of odd natural numbers? 125, 343,1728, 4096, 32768, 6859

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23. What is the smallest number by which the following numbers must be multiplied, so that the products are perfect cubes ? (I)675

(ii) 1323 (iii) 2560

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24. What is the smallest number by which the following numbers must be multiplied, so that the products are perfect cubes ? (I)7803

(ii) 107811 (iii) 35721

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25. By which smallest number must the following numbers be divided so that the quotient is a perfect cube? (I)675 (ii) 8640 (iii) 1600 (iv) 8788

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26. By which smallest number must the following numbers be divided so that the quotient is a perfect cube? (I)7803 (ii) 107811 (iii) 35721 (iv) 243000

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27. Prove that if a number is trebled then its cube is 27 times the cube of the given number.

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28. What happens to the cube of a number if the number multiplied by (I)3? (ii) 4 ? (iii) 5 ?

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29. Find the volume of a cube, one face of which has an area of 64 m^2.

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30. Find the volume of cube whose surface area is 384 m^2.

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31. Evaluate the following : (I) $\left\{\left(5^2+12^2\right)^{\frac{1}{2}}\right\}^3$

(ii) $\left\{\left(6^2+8^2\right)^{\frac{1}{2}}\right\}^3$

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32. Write the unit digit of the cube of each of the following numbers: 31,109,388,833,4276,5922,77774,44447, 125125125

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33. Which of the following numbers are not perfect cubes ? (I)64 (ii) 216 (iii) 243 (iv) 1728

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34. For each of the non-perfect cubes in previous question find the smallest number by which it must be (I)multiplied so that the product is a perfect cube. (ii)divided so that the quotient is a perfect cube.

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35. By taking three different values of n verify the truth of the following statements: (i) If n is even, then n^3 is also even.

(ii) if n is odd, then n^3 is also odd.

(iii) If n leaven remainder 1 when divided by 3, then n^3 also leaves 1 as remainder when divided by 3.

(iv) If a natural number n is of the form $3p + 2\, then\, n^3$ also a number of the same type.

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36. Write true (T) or false (F) for the following statements: (i)392 is a perfect cube.

(ii)8640 is not a perfect cube.

(iii)No cube can end with exactly two zeros.

(iv)There is no perfect cube which ends in 4.

(v)For an integer a, a^3 is always greater than a^2.

(vi)If $a \; and \; b$ are integers such that $a^2 > b^2, then \; a^3 > b^3$.

(vii)If a divides b , then a^3 divides b^3.

(viii)If a^2 ends in 9, then a^3 ends in 7

(ix)If a^2 ends in 5, then a^3 ends in 25.

(x)If a^2 ends in an even number of zeros, then ends in and odd number zeros.

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37. Show that 1331 is a perfect cube. What is the number whose cube is 1331 ?

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38. Which of the following numbers are cubes of negative integers? $1) -1728$ (ii) -3888

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39. Show that 17576 is a perfect cube. also, find the number whose cube is -17576.

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40. Find the cube of $\frac{2}{3}$.

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41. Find the cube of $5\frac{2}{7}$.

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42. Is $\frac{27}{125}$ a cube of a rational number ?

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43. Show that $\frac{-216}{42875}$ is the cube of a rational number. Also find the rational number.

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44. Find the cube of rational number 3.1.

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45. Show that 0.001728 is the cube of a rational number.

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46. Find the cubes of : -11 (ii) -12 (iii) -21

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47. Which of the following numbers are cubes of negative integers -64 (ii) -1056 (iii) -2197 -2744 (v) 42875

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48. Show that the following integers are cubes of negative integers. Also find the integer whose cube is the given integer. -5832 (ii) -2744000

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49. Find the cube of : $\frac{7}{9}$ (ii) $\frac{8}{11}$ (iii) $\frac{12}{7}$ (iv) $\frac{13}{8}$

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50. Find the cube of : $2\frac{2}{5}$ (ii) $3\frac{1}{4}$ (iii) 0.3 (iv) 1.5

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51. Find the cube of : 0.08 (ii) 2.1

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52. Find which of the following numbers are cubes of rational numbers: $\frac{27}{64}$ (ii) $\frac{125}{128}$ (iii) 0.001331 (iv) 0.04

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53. Find the cube root of 216

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54. Find the cube root of 343.

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55. Find the cube roots of the following numbers: 64 (ii) 343 (iii) 729

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56. Find the cube roots of the following numbers ; 2197 (ii) 389017 (iii) 91125

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57. Find the cube root of given number (i) 46656 (ii) 175616 (iii) 571787

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58. Find the cube root of 625

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59. Find the cube root of 91125.

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60. Find the smallest number which when multiplied with 137592 will make the product a perfect cube. Further, find the cube root of the product.

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61. Divide the number 26244 by the smallest number so that the quotient is a perfect cube.

Also fine the cube root of the quotient.

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62. Three numbers are to one another 2 : 3 : 4 : The sum of their cubes is 33957. Find the numbers.

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63. Find the cube roots of the following numbers by successive subtraction of

numbers: 1, 7, 19, 37, 61, 91, 127, 169, 217, 271, 331,397,...

i)64

(ii 512

(iii) 1728

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64. Using the method of successive subtraction examine whether or not the following numbers are perfect cubes: 130

(ii) 345 (iii) 792 (iv) 1331

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65. Find the cube root of each of the following natural numbers: 343 (ii) 2744 (iii) 4913

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66. Find the cube root of each of the following natural numbers: 1728 (ii) 35937 (iii) 17576

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67. Find the cube root of each of the following natural numbers:

(i)134217728

(ii) 48228544

(iii) 74088000

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68. Find the cube root of each of the following natural numbers:

(i)157464

(ii) 1157625

(iii) 33698267

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69. Find the smallest number which when multiplied with 3600 will make the product a perfect cube. Further, find the cube root of the product.

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70. Multiply 210125 by the smallest number so that the product is a perfect cube. Also find out the cube root of the product.

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71. What is the smallest number by which 8192 must be divided so that quotient is a perfect cube? Also find the cube root of the quotient so obtained.

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72. Three numbers are in the ratio 1 : 2 : 3 : The sum of their cubes is 98784. Find the numbers.

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73. The volume of cube is $9261000\ m^3$. Find the side of the cube.

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74. Find the cube root of 1728 .

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75. Find the cube root of 5832 .

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76. Find the cube roots of the following numbers:

$(i) 226981$

(ii) -571787

(iii) -175616

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77. Find the cube root each of the following :

216×1728 (ii) -125×-3375

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78. Find the cube root of each of the following numbers: 140×2450 (ii) -2300×5290

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79. Find the cube root of each of the following numbers : $\frac{1331}{4096}$ (ii) $\frac{-2197}{9261}$ (iii) $\frac{4096}{-2197}$ (iv) $\frac{-3375}{-2744}$

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80. Find the cube root 1.331.

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81. Find the cube root of 0.003375.

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82. The volume of a cubical box is 32.768 cubic metres. Find the length of a side of the box.

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83. Find the cube roots of each of the following integers: -125 (ii) -5832 (iii) -2744000 -753571 (iv) 32768

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84. Find the cube root of each of the following numbers: 8×125 (ii) -1728×216 (iii) -27×2744 (iv) -729×-15625

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85. Find the cube root of each of the following rational numbers: $\frac{-125}{729}$ (ii) $\frac{10648}{12167}$ (iii) $\frac{-19683}{24389}$ $\frac{686}{-3456}$ (v) $\frac{-39304}{-42875}$

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86. Find the cube root of each of the following rational numbers:

(i) 0.001728

(ii)(0.003375

(iii) 0.001

(iv)1.331

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87. Evaluate each of the following : (i) $\sqrt[3]{27} + \sqrt[3]{0.008} + \sqrt[3]{0.064}$

(i) $\sqrt[3]{1000} + \sqrt[3]{0.008} - \sqrt[3]{0.125}$

(iii) $\sqrt[3]{\frac{729}{216}} \times \frac{6}{9}$

(iv) $\sqrt[3]{\frac{0.027}{0.008}} \div \sqrt[3]{\frac{0.09}{0.04}} - 1$

(v) $\sqrt[3]{0.1 \times 0.1 \times 0.1 \times 13 \times 13 \times 13}$

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88. Show that : $(i) \frac{\sqrt[3]{729}}{\sqrt[3]{1000}} = \sqrt[3]{\frac{729}{1000}}$ (ii) $\sqrt[3]{\frac{-512}{343}} = \frac{\sqrt[3]{-512}}{\sqrt[3]{343}}$

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89. Fill in the blanks: $125\ x\ 273 = 3\ x\cdot$ (ii) $8\ x = 83\ 17283 = 4\ x$ (iv) $4803 = 33\ x\ 2\ x\ 3$ $3 = 73\ x\ 83$ (vi) $3 = 43\ x\ 53\ x\ 63\ \frac{27}{125}3 = \frac{}{5}$ (viii) $\frac{729}{1331}3 = \frac{9}{}\ \frac{512}{3} = \frac{8}{13}$

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90. The volume of a cubical box is 474.552 cubic metres. Find the length of each side of the box

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91. Three numbers are to one another 2 : 3 : 4 : The sum of their cubes is o.334125. Find the numbers.

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92. Find the side of a cube whose volume is $\frac{24389}{216} m^3$.

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93. Evaluate: $(i)\sqrt[3]{36} \times \sqrt[3]{384}$

$(ii)\sqrt[3]{96} \times \sqrt[3]{144}$

$(iii)\sqrt[3]{100} \times \sqrt[3]{270}$

$(iv)\sqrt[3]{121} \times \sqrt[3]{297}$

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94. Find the cube roots of the numbers

$(i)3048625 = 3375 \times 729$

$(ii)20346417 = 9261 \times 2197$

$(iii)210644875 = 42875 \times 4913$

$(iv)57066625 = 166375 \times 343$

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95. Find the units digits of the cube root of the following numbers:

(i)226981

(ii) 13824

(iii)571787

(iv) 175616

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96. Find the tens digit of the cube root of each of the numbers in previous question.

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97. Using cube root tables, find the cube root of

(i) 62

(ii) 620

(iii) 6200

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98. Find the cube root of 448.

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99. Find the cube root of 17064.

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100. Using cube root table, find the value of $\sqrt[3]{\frac{51}{125000}}$

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101. Using cube tables, find the cube root of 85.9.

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102. Using cube root table , find the cube root 953.

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103. Using cube root table, find the cube root of 5319.

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104. Using cube root table, find the cube root of 309400.

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105. Making use of the cube root table find the cube roots of the following (correct t0 three

decimal places) : (i) 7 (ii) 70 (iii) 700

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106. Making use of the cube root table find the cube roots of the following (correct t0 three decimal places) : 7000 (ii) 1100 (iii) 780

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107. Making use of the cube root table find the cube roots of the following (correct t0 three decimal places) : 7800 (ii) 1346 (iii) 250

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108. Making use of the cube root table find the cube roots of the following (correct t0 three decimal places) : 5112 (ii) 9800 (iii) 732

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109. Making use of the cube root table find the cube roots of the following (correct t0 three decimal places) :

(i)7342

(ii)133100

(iii)37800

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110. Making use of the cube root table find the cube roots of the following (correct t0 three decimal places) : 0.27 (ii) 8.6 (iii) 0.86

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111. Making use of the cube root table find the cube roots of the following (correct t0 three decimal places) : (i)8.65 (ii) 7532 (iii) 833 (iv) 34.2

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112. What is the length of the side of a cube whose volume is 275 cm^3. Make use of the table for the root.

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