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MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

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 cube of 24^3 by using column method.

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10. Using column method find the cubes of the following natural numbers. (I) 42 (ii) 45 (iii) 87

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11. Using column method find the cubes of the following numbers: (1) 98 (2) 99 (3) 85

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12. Find the cubes of the following numbers :

(i) 7 (ii) 12 (iii) 16

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13. Find the cubes of the following numbers :

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

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14. Find the cubes of the following numbers :

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

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15. 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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16. 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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17. 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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18. Write the cubes of 5 natural number which are of form $3n+1\left(e\dot{g}.\ 4, 7, 10\right)$ 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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19. Write the cubes of 5 natural numbers of the form $3n + 2(i\dot{e}.5, 8, 11,)$ 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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20. 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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21. Which of the following are perfect cubes?

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

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22. Which of the following are perfect cubes?

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

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23. Which of the following are perfect cubes ?

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

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

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

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26. 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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27. 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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28. 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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29. By which smallest numbers 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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30. Prove that if a number is tripled then its cube is 27 times the cube of the given number.

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

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

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

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34. 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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35. Write the unite digit of the cube of each of the following numbers:

31,109,388,833,4276,5922,77774

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36. Find the cubes of the following numbers by column method: 35 (ii) 56 (iii) 72

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

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38. By taking three different values of n verify the truth of the following statements: If n is even, then n^3 is also even. if n is odd, then n^3 is also odd. If n leaven remainder 1 when divided by 3, then n^3 also leaves 1 as remainder when divided by 3. 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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39. Write true (T) or false (F) for the following statements: 392 is a perfect cube. 8640 is not a perfect cube. No cube can end with exactly two zeros. There is no perfect cube which ends in 4. For an integer a, a^3 is always greater than a^2. If $a \, and \, b$ are integers such that $a^2 > b^2, then \, a^3 > b^3$. If a divides b , then a^3 divides b^3. If a^2 ends in 9, then a^3 ends in 7 If a^2 ends in 5, then a^3 ends in 25. If a^2 ends in an even number of zeros, then ends in and odd number zeros.

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

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

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

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

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

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

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

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47. Find the cube of rational number 3.1.

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

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

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

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

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

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54. Find the cube of : (i) 0.08 (ii) 2.1

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

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56. Find the cube root of 216

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57. Find the cube root of 343.

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

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59. Find the cube roots of the following numbers ; (a)2197 (b) 389017 (c) 91125

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

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61. Find the cube root of 621

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62. Find the cube root of 91125.

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63. 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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64. 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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65. Three numbers are to one another 2 : 3 : 4 : The sum of their cubes is 33957. Find the numbers.

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66. 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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67. Using the method of successive subtraction (numbers: 1, 7, 19, 37, 61, 91, 127, 169, 217, 271, 331, 397,...) examine whether or

not the following numbers are perfect cubes:

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

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68. using the method of successive subtraction examine whether or not the following numbers are perfect cube

(i) 130 (ii) 345 (iii) 792 (iv) 1331

Find the smallest number that must be subtracted from those of the numbers in above question which are not perfect cubes,

to make them perfect cubes. What are the corresponding cube roots?

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

(iii) 4913

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

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71. Find the cube root of each of the following natural numbers: 134217728 (ii) 48228544 (iii) 74088000

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72. Find the cube root of each of the following natural numbers: 157464 (ii) 1157625 (iii) 33698267

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73. 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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74. 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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75. 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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76. Three numbers are in the ratio 1 : 2 : 3 : The sum of their cubes is 98784. Find the numbers.

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

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78. Find the cube root of 1728 .

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79. Find the cube root of 5832 .

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80. Find the cube roots of the following numbers: 226981 (ii) -571787 (iii) -175616

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81. Find the cube root each of the following :

$216\ x\ 1728$ (ii) $-125\ x(\ -\ 3375)$

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82. Find the cube root of each of the following numbers: $140\ x\ 2450$ (ii) $-2300\ x\ 5290$

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83. Evaluate: $13723X1458.3$

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84. 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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85. Find the cube root 1.331.

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86. Find the cube root of 0.003375.

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

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

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89. Show that: $(i) 27^{\frac{1}{3}} X\ 64^{\frac{1}{3}} = (27X64)^{\frac{1}{3}}$

$(ii)(64X\ 729)^{\frac{1}{3}} = 64^{\frac{1}{3}} X\ 729^{\frac{1}{3}}$

$(iii)(-125X\ 216)^{\frac{1}{3}} = -125^{\frac{1}{3}} X\ 216^{\frac{1}{3}}$

$(iv)(-125X-1000)^{\frac{1}{3}} = -125^{\frac{1}{3}} X\ -1000^{\frac{1}{3}}$

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90. Find the cube root of each of the following numbers: (i) $8\ x\ 125$ (ii) $-(1728)x216$ (iii) $-(27)\ x\ 2744$ (iv) $-(729)x(-15625)$

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91. Evaluate: (i) $\sqrt[3]{4^3 \times 6^3}$ (ii) $\sqrt[3]{8 \times 17 \times 17 \times 17}$ (iii) $\sqrt[3]{700 \times 2 \times 49 \times 5}$ (iv) $125\sqrt[3]{a^3}$ - $\sqrt[3]{125a^6}$

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

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93. Find the cube root of each of the following rational numbers: 0.001728 (ii) 0.003375 (iii) 0.001 (iv) 1.331

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94. Evaluate each of the following :

$\sqrt[3]{27} + \sqrt[3]{0.008} + \sqrt[3]{0.064}$

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

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95. Show that : (i) $\frac{(729)^{\frac{1}{3}}}{(1000)^{\frac{1}{3}}} = \left(\frac{729}{1000}\right)^{\frac{1}{3}}$

(ii) $\frac{(-512)^{\frac{1}{3}}}{(343)^{\frac{1}{3}}} = \left(-\frac{512}{343}\right)^{\frac{1}{3}}$

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96. (i) $\sqrt[3]{(125\times27)} = 3 \times .....$ (ii) $\sqrt[3]{(8\times.....)} = 8$ (iii) $\sqrt[3]{1728} = 4 \times .....$ (iv) $\sqrt[3]{480} = \sqrt[3]{3}\times2\times \sqrt[3]{.....}$ (v) $\sqrt[3]{.....} = \sqrt[3]{7} \times \sqrt[3]{8}$

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

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98. Three numbers are to one another 2 : 3 : 4 . The sum of their cubes is 0.334125. Find the numbers.

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

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100. Evaluate: $(i) 36^{\frac{1}{3}} X\ 384^{\frac{1}{3}} \quad (ii) 96^{\frac{1}{3}}\ X\ 144^{\frac{1}{3}}$

$(ii) 100^{\frac{1}{3}} X 270^{\frac{1}{3}}\ (iv) 121^{\frac{1}{3}} X\ 297^{\frac{1}{3}}$

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101. Find the cube roots of the numbers 2460375, 20346417, 210644875, 57066625 using the fact that $2460375 = 3375X\ 729$

$20346417 = 9261X\ 2197$

$210644875 = 42875X\ 4913$

$57066625 = 166375X\ 343$

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102. Find the units digits of the cube root of the following numbers: (i) 226981 (ii) 13824 (iii) 571787 (iv) 175616

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103. Using cube root tables, find the cube root of (i) 62 (ii) 620 (iii) 6200

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104. Find the cube root of 448.

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105. Find the cube root of 17064.

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106. Using cube root table, find the value of

$$\left(\frac{51}{125000}\right)^{\frac{1}{3}}$$

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

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

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

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

111. Making use of the cube root table find the cube roots of the following (correct to three decimal places) : (i) 7 (ii) 70 (iii) 700

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

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

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114. Making use of the cube root table find the cube roots of the following (correct to three

decimal places) : 5112 (ii) 9800

(iii) 732

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115. Making use of the cube root table find the cube roots of the following (correct to three decimal places) : 7342 (ii) 133100

(iii) 37800

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

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117. Making use of the cube root table find the cube root of the following (correct to three decimal places) : 8.65

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118. 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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