

# Grade 08

## Unit 05



# Maths

## Course Outline

- Cube roots
- Comparing quantities

# MAT

(Monthly Achievement Tests)

Short Code: 447309

Test ID: NMM08U050

### Guide Lines

1. Each set consists of:


50 | Warm-up/Foundation Questions

30 | Regular Questions

20 | Thinking Ability Questions

06 | Non-routine Questions

- The time allocation and instructions regarding the questions are printed clearly in the beginning of each question types. The answers should be written or tick marked as per the instructions given. It is suggested to use pencil initially, so as to enable you to reuse the practice papers.
- According to the new pattern of CBSE these practice papers will be very useful especially for syllabus related Quiz, Debates, Visuals related checking and Orals etc.,**
- After marking the answers, the scores of students can be checked and for marks obtained guidelines are given along with the question solving instructions. Follow those instructions and if, you are fully satisfied with your performance then check for your expected grades as per the CBSE guidelines as given on the back of each set.
- Remember that this is only a guideline not the finally worked out result. You can further improve your performance by increase your practice.
- For your convenience please follow following essential examiner's advices:
  - Answer all the questions
  - Read all the Options carefully
  - Understand and use correct scientific language in your responses.

We from  wish skillful learning for your bright future.

## Before going for the test, look at least :

1. First of all go through the syllabus of the test according to the **Course Outline** provided at the front page of each MAT.
2. After going through the syllabus once or twice or even more time as per your satisfaction, first of all do the Warm-up questions. If you score A+ grade in those 50 questions go to the next level otherwise go through the chapter again.
3. The box for **Specific Information** is very useful as it adds to your concept building. Try to fill specific information in the proper way so that you will get the maximum benefit of it.
4. **Let's Chat** portion will help you to prepare for oral assessment. Through this you can increase your capacity to interact on a particular topic related to your syllabus.
5. The **Extra Diet** portion is also there to enhance your knowledge through visualization of concept. This portion provides you added knowledge on various related concepts.
6. The information related to time factor is there to enhance your time management skills.
7. From the examiners point of view it is always advised to use Pencil for initial efforts. The use of pen is fruitful only when the final effort comes.

## Examiner's Tips:

- ☞ Read the question carefully. Make sure you understand exactly what is required.
- ☞ If you find that you are unable to do a part of a question, do not give up. The next part may be easier and may provide a clue to what you might have done in the part you found difficult.
- ☞ Note the number of marks per question as guide to the depth of response needed.
- ☞ Underline or note the key words that tell you what is required.
- ☞ Underline or note data as you read the question.
- ☞ Structure your answer carefully.
- ☞ Show all steps in calculations. Include equations you use and show the substitution of data. remember to work according to units given.
- ☞ Make sure that your answers contain suitable significant figures (wherever necessary) and must include units in numericals.
- ☞ Draw diagrams and graphs carefully.
- ☞ Read data from graphs carefully; note scales and prefixes on axes.
- ☞ Keep your eye on the clock but don't panic.
- ☞ If you have time at the end, use it. Check that your descriptions and explanations make sense. Consider whether there is anything you could add to an explanation or description. Repeat calculations to ensure that you have not made a mistake.

**To enlighten your fundamental/basic topic knowledge.**

- A+.** If you score 45 or above marks, move to the next section confidently.
- A.** If you score between 40 and 45 marks, it is satisfactory. Bit more knowledge will bring excellent result.
- B.** If you score below 40, kindly go through the topic more seriously.

### Section A (50 marks)

**Time given – 50 minutes + 5 minutes for revision**

**Questions 1 to 50 carry 1 mark each.**

**For questions 1 to 20 four options are given one of them is the correct answer make your choice and write its name (a, b, c or d) in the answer box provided.**

1. Identify whether the following number is perfect cubes:

(a) 4000

(b) 5000

(c) 1080

(d) none of these

**T** – 1 min  
**S** – Perfect cube

Ans.

2. Identify whether the following number is not perfect cubes:

(a) 2744

(b) 5832

(c) 5184

(d) None of these

**T** – 1 min  
**S** – Perfect cube

Ans.

3. Which of the following is not a perfect cube?

(a) 1331

(b) 1364

(c) 1728

(d) 2197

**T** – 1 min  
**S** – Perfect cube

Ans.

4. The cube root of 8000 is:

(a) 15

(b) 20

(c) 25

(d) 30

**T** – 1 min  
**S** – Cube root

Ans.

5. The cube root of 3375 is:

(a) 15

(b) 20

(c) 21

(d) 23

**T** – 1 min  
**S** – Cube root

Ans.

6. Which of the following is a perfect cube?  
(a) 401 (b) 3378  
(c) 15625 (d) 2024

T – 1 min  
S – Perfect cube

Ans.

7. Mohan bought a CD Player for Rs. 750 and sold it for Rs. 875. Find his gain percent.  
(a) 16% (b)  $16\frac{2}{3}\%$   
(c)  $16\frac{1}{4}\%$  (d) 17%

T – 1 min  
S – Comparing Quantities

Ans.

8. If the amount of Rs 9000 for 3 years, compounded annually at 5% per annum is 9261. Find the compound interest.  
(a) Rs. 1261 (b) Rs. 1281  
(c) Rs. 1200 (d) Rs. 3000

T – 1 min  
S – Comparing Quantities

Ans.

9. On increasing the salary of a man by 25% it becomes Rs. 20000. What was his original salary?  
(a) Rs. 15000 (b) Rs. 16000  
(c) Rs. 18000 (d) Rs. 25000

T – 1 min  
S – Comparing Quantities

Ans.

10. The value of a machine depreciates 10% annually. If its present value is Rs. 25000. What will be its value after one year?  
(a) Rs. 27500 (b) Rs. 22500  
(c) Rs. 25250 (d) none of these

T – 1 min  
S – Comparing Quantities

Ans.

**For questions 11 to 20, write true or false for the following statements:**

11. 1728 is a perfect cube but 17280 is not a perfect cube.

T – 1 min  
S – Cubes

Ans.

12. For an number  $a$ ,  $a^3$  is always greater than  $a^2$ .

T – 1 min  
S – Squares and cube

Ans.

13. If  $a^2$  ends in an even number of zeros, then  $a^3$  ends in an odd numbers of zeros.

T – 1 min  
S – Square and cube

Ans.

14. No perfect cube ends with an even numbers of zeros.

T – 1 min  
S – Cubes

Ans.

15. If  $n$  on dividing by 3, leaves the remainder 1, then  $n^3$  also leaves 1 as remainder when divided by 3.

T – 1 min  
S – Cubes

Ans.

16. Cube of any odd number is even.

T – 1 min  
S – Cubes

Ans.

17. 200 is the smallest 3 digit perfect cube.

T – 1 min  
S – Cube roots

Ans.

18. A perfect cube does not end with two zeros.

T – 1 min  
S – Cube roots

Ans.

19. The cube of a single digit number may be a single digit number.

T – 1 min  
S – Comparing quantities

Ans.

20. The discount is allowed on the marked price.

T – 1 min  
S – Comparing quantities

Ans.

For questions 21 to 30, fill the table given below:

	Number	Cubes	Number	Cube root	
21.	5	_____	_____	8000	T – 1 min
22.	9	_____	_____	6859	S – Cube and cube root
23.	10	_____	_____	5832	
24.	14	_____	_____	4913	
25.	19	_____	_____	_____ 4096	

Ans. \_\_\_\_\_

26. \_\_\_\_\_ is a reduction given on marked price.

T – 1 min  
S – Comparing quantities

Ans. \_\_\_\_\_

27. \_\_\_\_\_ = Buying price + Overhead expenses.

T – 1 min  
S – Comparing quantities

Ans. \_\_\_\_\_

28. If two or more discounts are allowed one after the other then such discounts are known as \_\_\_\_\_.

T – 1 min  
S – Comparing quantities

Ans. \_\_\_\_\_

29. \_\_\_\_\_ = Amount – Principal.

T – 1 min  
S – Comparing quantities

Ans. \_\_\_\_\_

30. \_\_\_\_\_ always reckoned on the Cost price.

T – 1 min  
S – Comparing quantities

Ans. \_\_\_\_\_

31. Find the cube of  $\frac{3}{5}$ .

T – 1 min  
S – Cube roots

Ans. \_\_\_\_\_

32. Is  $\frac{27}{1331}$  cube of a rational number?

T – 1 min  
S – Cube roots

Ans.

33. Solve:  $\sqrt[3]{0.002197}$

T – 1 min  
S – Cube roots

Ans.

34. Find the cube root of 0.65.

T – 1 min  
S – Cube roots

Ans.

35. Find the cube root of 5200.

T – 1 min  
S – Cube roots

Ans.

**Questions 36-38, Find the cube root of the following:**

36. 343

T – 3 min  
S – Cube roots

Ans.

37. 10648

Ans.

38. 9261

Ans.

39. Find the CI on Rs. 12600 for 2 years at 10% per annum compounded annually.

T – 1 min  
S – Comparing quantities

Ans.

40. A sum of Rs. 10,000 is borrowed at a rate of interest 15% per annum for 2 years. Find the simple interest on this sum and the amount to be paid at the end of 2 years.

T – 1 min  
S – Comparing quantities

Ans.

### Mathc the following

T – 5 min  
S – Comparing quantities

#### Column-I

#### Column-II

41. Compound Interest

$$(i) A = \left( P \frac{r}{100} \right)^n$$

42. Simple Interest

$$(ii) \frac{P \times R \times T}{100}$$

43. Find the compound interest at the rate of 10% per annum for four years. At the rate of 4% per annum for four years gives Rs. 160000 simple interest.

$$(iii) 1000000$$

44. The principal amount in the above question

$$(iv) \text{Rs. } 464100$$

Ans.

45. Find the amount of Rs. 125000 after 3 years, when the interest is compounded annually at the rate of 6% per annum.

T – 1 min  
S – Comparing quantities

Ans.



46. Utkarsh bought 20 dining tables for Rs. 120000 and sold these at a profit equal to the selling price of 4 dining tables. Find the S.P. of one dining table.

T – 1 min  
S – Comparing quantities

Ans.

47. A goldsmith bought 100 g of gold for Rs. 54000 from a wholesaler. He then sold it at a gain of 10%. Find the (i) SP of 10 g of gold for the goldsmith (ii) CP of 10 g of gold for the wholesaler, if his profit is 8%.

T – 1 min  
S – Comparing quantities

Ans.

48. Find the cube root of 125.

T – 1 min  
S – Cube roots

Ans.

49. Gain = \_\_\_\_\_.

T	– 1 min
S	– Comparing quantities

Ans.

50. Find the cube root of 1331.

T	– 1 min
S	– Cube roots

Ans.

To enlighten your regular knowledge of topic. If you score more than 55 marks here, you have achieved this level brilliantly. Move to the next level of test papers.

Section B (60 marks)

Time given – 45 minutes + 5 minutes for revision

Questions 51 to 80 carry 2 marks each.

51. By what smallest number should 144 be must placed so that the product become a perfect cube?

T	– 1 min
S	– Cube

Ans.

52. By what smallest number should 1600 be divided so that the quotient becomes a perfect cube?

T	– 1 min
S	– Cube

Ans.

53. Find the smallest number that must be subtracted from 686 to make it a perfect cube.

T	– 1 min
S	– Cube

Ans.

54. By what smallest number should  $-3456$  be multiplied so that the product becomes a perfect cube?

T – 1 min  
S – Cubes

Ans.

55. By what smallest number should  $-2592$  be divided so that the quotient becomes a perfect cube?

T – 1 min  
S – Cubes

Ans.

56. Find the smallest number that must be subtracted from  $192$  so as to make it a perfect cube.

T – 1 min  
S – Cube

Ans.

57. Estimate the cube root of  $\frac{343}{3375}$ .

T – 1 min  
S – Cube

Ans.

58. Estimate the cube root of 0.005832.

T – 1 min  
S – Cubes

Ans.

59. Is 1188 a perfect cube? If not, by which smallest natural number should 1188 be divided so that the quotient is a perfect cube?

T – 1 min  
S – Cubes

Ans.

60. Is 392 a perfect cube? If not, find the smallest natural number by which 392 must be multiplied so that the product is a perfect cube.

T – 1 min  
S – Cubes

Ans.

61. Find the cube root of 13824 by prime factorisation method.

T – 1 min  
S – Cubes

Ans.

62. Find the cube root of 17576 through estimation.

T – 1 min  
S – Cubes

Ans.

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

T – 1 min  
S – Cubes

Ans.

64. What is the least number by which 143748 must be multiplied so that the product becomes a perfect cube?

T – 1 min  
S – Cubes

Ans.

65. What is the smallest number by which 1458 must be divided so that the quotient is a perfect cube?

T – 1 min  
S – Cubes

Ans.

66. Find discount in percent when  $MP = \text{Rs. } 625$  and  $SP = \text{Rs. } 562.50$ .

T – 2 min  
S – Comparing quantities

Ans.

67. At a clearance sale, all goods are on sale at 45% discount. If I buy a skirt marked Rs. 600, how much would it need to pay?

T – 2 min  
S – Comparing quantities

Ans.

68. Shyam deposited Rs. 7500 in a bank for 6 months at the rate of 8% interest compounded quarterly. Find the amount he received after 6 months.

T – 2 min  
S – Comparing quantities

Ans.

Questions 69-72, match the following

T – 8 min  
S – Comparing quantities

**Column I**

**Column II**

- |  |          |
|--|----------|
| 69. If $MP = \text{Rs. } 1300$ and $\text{Discount} = 10\%$ then the $SP$ is   | Rs. 425  |
| 70. $MP = \text{Rs } 500$ , $\text{Discount} = 15\%$ the $SP$ is   | Rs. 1170 |
| 71. If $SP = \text{Rs. } 810$ , $\text{gain} = 8\%$ then $CP$ is   | Rs. 550  |
| 72. $SP = \text{Rs. } 495$ , $\text{Discount} = 10\%$ then $MP$ is   | Rs. 750  |
| 73. Maria invests Rs. 93,750 at 9.6% per annum for 3 years and the interest is compounded annually. Calculate (i) The amount standing to her credit at the end of the 2nd year (ii) The interest for the 3 <sup>rd</sup> year. |          |

T – 2 min  
S – Comparing quantities

Ans.

For questions 74-78, complete the following table:

T – 10 min  
S – Comparing quantities

	Principal	Rate	Time	Amount	Compound interest
74.	Rs. 4,000	5%	2 years	_____	_____
75.	Rs. 6,000	10%	2 "	_____	_____
76.	Rs. 6250	4%	2 "	_____	_____
77.	Rs. 20000	7.5%	3 "	_____	_____
78.	Rs. 31,250	8%	3 "	_____	_____



79. What price should the trader mark on an article that cost him Rs. 918 to gain 20% after allowing a discount of 15%?

T – 2 min  
S – Cube roots

Ans.

80. What sum of money will amount Rs. 45,582.25 at  $6\frac{3}{4}\%$  per annum in two years. interest being compounded annually?

T – 2 min  
S – Comparing quantities

Ans.

To enlighten your regular knowledge of topic. If you score more than 50 marks here, you have achieved this level brilliantly. Move to the next level of test papers.

Section C (60 marks)

Time given – 45 minutes + 5 minutes for revision

81. Find the volume of a cube, whose surface area is  $486 \text{ m}^2$ .

T – 2 min  
S – Cube roots

Ans.

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

T – 2 min  
S – Cube roots

Ans.

83. The volume of a cubical base is 2744 cubic metres. Find the length of a side of the base.

T – 2 min  
S – Cube roots

Ans.

84. If the side of a cube is 16 cm long. Find the total surface area of the cube.

T – 2 min  
S – Cube roots

Ans.

85. You are told that 1331 is a perfect cube. Can you guess without factorisation, what is its cube root? Similarly, guess the cube roots of 4913, 12167, 32768.

T – 2 min  
S – Cube roots

Ans.

86. From a metallic cuboid measuring  $80\text{ cm} \times 20\text{ cm} \times 5\text{ cm}$  a single cube is formed. Find the edge of the new cube.

T – 2 min  
S – Cube roots

Ans.

87. The volume of a metallic cube is  $1728 \text{ cm}^3$ . Find its edge.

T – 2 min  
S – Cube roots

Ans.

88. Find the smallest number that must be added to 500 so as to make it a perfect cube. What is the corresponding cube root?

T – 2 min  
S – Cube roots

Ans.

89. Is 68600 a perfect cube? If not, find the smallest number by which 68600 must be multiplied to get a perfect cube.

T – 2 min  
S – Cube roots

Ans.

90. Is 53240 a perfect cube? If not, then by which smallest natural number should 53240 be divided so that the quotient is a perfect cube?

T – 2 min  
S – Cube roots

Ans.

91. A picnic is being planned in a school for class IX. Girls are 60% of the total number and are 18 in number. Calculate the ratio of number of girls to the number of boys in the class.

T – 2 min  
S – Comparing quantities

Ans.

92. A machinery worth Rs. 10,500 depreciated by 5%. Find its value after one year.

T – 2 min  
S – Comparing quantities

Ans.

93.  $A = ?$ ,  $CI = ?$ ,  $P = \text{Rs. } 10800$ ,  $T = 3 \text{ yr}$ ,  $R = 12\frac{1}{2}\%$ .

T – 2 min

S – Comparing quantities

Ans.

94. At what rate percent per annum, will a sum of Rs. 2000 amount to Rs. 2205 in 2 years, compounded annually.

T – 2 min

S – Comparing quantities

Ans.

95. Find the compound interest on Rs. 5000 for 1 year at 8% per annum, compounded half-yearly.

T – 2 min

S – Comparing quantities

Ans.

96. A trader marks his goods at 40% above the cost price and allows a discount of 25%. What is his gain percent?

T – 3 min  
S – Comparing quantities

Ans.

97. A reduction of 20% in the price of sugar enables Mrs. Shah to buy an extra 5 kg of it for Rs. 320. Find (i) the original rate and (ii) the reduced rate per kg.

T – 3 min  
S – Comparing quantities

Ans.

98.  $P = \text{Rs. } 8000$ ,  $T = 1 \text{ yr} = 2 \text{ half years}$ ,  $R = 9\% \text{ per annum} = \frac{9}{2}\% \text{ per half year}$ ,  
 $A = ?$ ,  $CI = ?$

T – 3 min  
S – Comparing quantities

Ans.

99. A dealer of scientific instruments allows 20% discount on the marked price of the instruments and still makes a profit of 25%. If his gain over the sale of a instrument is Rs. 150, find the marked price of the instrument.

T – 2 min  
S – Comparing quantities

Ans.

100. What price should Suneeta mark on a sari which costs her Rs. 2200 to gain 26% after allowing a discount of 12%?

T – 2 min  
S – Comparing quantities

Ans.



These are not compulsory-type questions. But in favour of students, it is advised to solve these questions very carefully. No marks are allowed for this section.

Section D (10 questions)

Time given – 30 minutes + 5 minutes for revision

101. Estimate the cube root of  $\frac{1331}{9261}$ .

Ans.

102. Find the smallest number by which 1458 must be divided so that in quotient in a perfect cube.

Ans.

*Find the cube root of the following :*

103.  $(-1728) \times 216$

Ans.

104.  $125 \times (-343)$

Ans.

105.  $-1728000$

Ans.

106. 
$$\begin{array}{r} -2197 \\ -3375 \\ \hline \end{array}$$

Ans.

# Tools at a glance

**Opening Window** with instructions for your potential analysis and guideline to improve your performance.

**Opening Window**

**Let's Chat**, the feature with suggestive topics for discussion so as to improve your capacity to debate on various topics.

T — .....  
S — .....

Box with time break-up of questions (T) and its concept (S, i.e., subject)

 Let's Chat

**Brain Teasers**



**Brain Teasers** i.e., Questions with difference to make the concepts of students crystal clear. These are the questions with higher difficulty levels to check the grip of the students over the concepts.

**Extra Diet**, the web link, the notation: [www.\\_\\_\\_\\_\\_](#) to provide additional information regarding the concept for more clarity of thoughts.

**Extra Diet**

## CBSE GRADING PATTERN

As the new pattern includes **CCE** (Continuous and Comprehensive Evaluation) which will be run in two terms i.e., from April to September and October to March. Thus the school will conduct four **Formative** and two **Summative** Assessments.

However, the most generalised version of grades is given below:

MARKS	PERCENTAGE	GRADE	GRADE POINT	CATEGORY
91 to 100		A1	10	Exceptional
81 to 90		A2	9	Excellent
71 to 80		B1	8	Very Good
61 to 70		B2	7	Good
51 to 60		C1	6	Ordinary (Fair)
41 to 50		C2	5	Average
33 to 40		D	4	Below Average
21 to 32		E1	3	Improvement Needed
Below 20		E2	Below 2	Unsatisfactory