Grade 08
Unit 01

Maths

Course Outline

- **Rational Numbers**
- **Linear equations in one variable**

MAT

(Monthly Achievement Tests)

Short Code: 447309

Test ID: NMM08U010

SOUVENIR INFOTECH

Guide Lines

1. Each set consists of:

   50 | Warm-up/Foundation Questions

   30 | Regular Questions

   20 | Thinking Ability Questions

   06 | Non-routine Questions

2. 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.

3. **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.,**

4. 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.

5. Remember that this is only a guideline not the finally worked out result. You can further improve your performance by increase your practice.

6. For your convenience please follow following essential examiner's advices:

   a. Answer all the questions
   b. Read all the Options carefully
   c. Understand and use correct scientific language in your responses.

We from SOUVENIR INFOTECH **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 you knowledge through visulization 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.

50

Opening Window

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. Rational number $\frac{a}{b}$

T – 1 min
S – Rational Numbers

(a) a and b are of the positive number
(b) a and b are of the opposite sign
(c) a and c are of the negative sign
(d) (a) and (c) both

Ans.

2. Which of the following are rational numbers?
$\frac{1}{1}, \frac{1}{0}, \frac{0}{1}, \frac{0}{0}$

T – 1 min
S – Rational Numbers

(a) $\frac{1}{1}$ (b) $\frac{1}{0}$
(c) $\frac{1}{1}$ and $\frac{0}{1}$ (d) $\frac{0}{1}$ and $\frac{0}{0}$

Ans.

3. Which of the following pairs have equivalent rational numbers?
(i) $\frac{12}{-7}, \frac{-36}{21}$ (ii) $\frac{-4}{9}, \frac{-50}{135}$ (iii) $\frac{-6}{5}, \frac{42}{-35}$

T – 1 min
S – Rational Numbers

(a) (i) and (ii) (b) (i) and (iii)
(c) (i), (ii) and (iii) (d) None of these

Ans.

4. What is the value of x?
$\frac{3}{-5} = \frac{36}{x}$

T – 1 min
S – Rational Numbers

(a) –40 (b) –50 (c) –60 (d) –70

Ans.

5. Sum of $\frac{-2}{12}$ and $\frac{-3}{12}$ is

T – 1 min
S – Rational Numbers

(a) $\frac{-3}{11}$ (b) $\frac{-7}{12}$ (c) $\frac{-5}{12}$ (d) $\frac{-7}{13}$

Ans.

6. Addition of $\frac{3}{7}$ and $\frac{-6}{11}$ is equal to

T – 1 min
S – Rational Numbers

(a) $\frac{11}{7}$ (b) $\frac{-9}{77}$ (c) $\frac{13}{70}$ (d) $\frac{1}{7}$

Ans.

7. $\frac{3}{-4}$ _____ $\frac{-5}{6}$

T – 1 min
S – Rational Numbers

(a) > (b) <
(c) = 0 (d) None of these.

Ans.

8. $\frac{-3}{5}$ = _____

T – 1 min
S – Rational Numbers

(a) $\frac{14}{10}$ (b) $\frac{5}{10}$
(c) $\frac{-6}{10}$ (d) $\frac{-9}{10}$

Ans.

9. Multiplicative inverse of -1

T – 1 min
S – Rational Numbers

(a) 1 (b) -1
(c) 0 (d) None of these.

Ans.

10. $\frac{1}{5} + $ _____ $= \frac{1}{5}$

T – 1 min
S – Rational Numbers

(a) $\frac{-1}{5}$ (b) $\frac{1}{5}$
(c) 1 (d) 0

Ans.

11. The value of x in $2x - 3 = x + 2$ is

T – 1 min
S – Linear equation in one variable

(a) 2 (b) 3
(c) 4 (d) 5

Ans.

12. If $7y = 18 + y$, then $y =$

(a) 3 (b) 2

(c) 1 (d) 4

T – 1 min
S – Linear equation in one variable

Ans.

13. Find the value of x if $\frac{5x-4}{8} - \frac{x-3}{5} = \frac{x+6}{4}$

(a) 4 (b) 8

(c) 10 (d) 12

T – 1 min
S – Linear equation in one variable

Ans.

14. Four-fifth of a number is greater than three fourth of the same number by 4. The number is

(a) 12 (b) 64

(c) 80 (d) 102

T – 1 min
S – Linear equation

Ans.

15. Solve $8x = 20 + 3x$

(a) 3 (b) 4

(c) 5 (d) 8

T – 1 min
S – Linear equation

Ans.

16. The value of x in $\frac{6x+1}{3} + 1 = \frac{x-3}{6}$ is

(a) -1 (b) -2

(c) 1 (d) 2

T – 1 min
S – Linear equation

Ans.

17. The age of A and B are in the ratio 3 : 8, six years from now, their ages will be in the ratio 4 : 9. The present age of A is

(a) 18 years (b) 15 years

(c) 12 years (d) 21 years.

T – 1 min
S – Linear equation

Ans.

18. The value of z in $\frac{\frac{3}{4}z+7}{\frac{2}{5}z-4} = \frac{5}{4}$ is

(a) 48 (b) – 48

(c) 24 (d) -24

T – 1 min
S – Linear equation

Ans.

19. A race boat covers a distance of 66 km downstream in 110 minutes. The speed of the boat in still water is 34.5 km/hr. The speed of the stream is

(a) 1 km/hr (b) 1.2 km/hr (c) 1.5 km/hr (d) 2 km/hr

T – 1 min
S – Linear equation

Ans.

20. The value of y in $2y + 8 = -5$ is

(a) $\frac{1}{2}$ (b) $\frac{15}{2}$

(c) $\frac{-8}{3}$ (d) $\frac{-13}{2}$

T – 1 min
S – Linear equation

Ans.

Fill in the blanks

21. $\frac{a}{b} + \left(\frac{-a}{b}\right) = 0$, $\frac{-a}{b}$ is called as an _____ of $\frac{a}{b}$.

T – 1 min
S – Rational Numbers

Ans.

22. The reciprocal of –5 is _____.

T – 1 min
S – Rational Numbers

Ans.

23. $\sqrt[n]{x}$ is called a rational number, n is called the _____ of the radical.

T – 1 min
S – Rational Numbers

Ans.

24. If x be a positive rational number and p and q non zero rational numbers then $x^{-p/q}$ = _____.

T – 1 min
S – Rational Numbers

Ans.

25. If x is a negative rational number and n is an even positive integer then the nth root of a is not _____.

T – 1 min
S – Rational Numbers

Ans.

26. Equations involving only linear polynomial is called a _____.

T – 1 min
S – Linear equation

Ans.

27. (a) $\frac{1}{3}$ times p = _____

(b) h times $\frac{1}{5}$ = _____

T – 1 min
S – Linear equation in one variable

Ans.

28. (a) y divided by 4 = $\square \bigcirc \square$

$= \frac{\square}{\square}$

(b) k divided by 120 = _____

T – 1 min
S – Linear equation in one variable

Ans.

29. y × _____ = $\frac{y}{2}$

T – 1 min
S – Linear equation in one variable

Ans.

30. _____ $\div 5 = \frac{m}{5}$

T – 1 min
S – Linear equation in one variable

Ans.

True or False

31. 200 is the smallest 3 digit perfect square.

T – 1 min
S – Rational number

Ans.

32. $(-1)^{-1} = -1$.

T – 1 min
S – Rational number

Ans.

33. Index of radical is never negative.

T – 1 min
S – Rational number

Ans.

34. The product of two rational number is always a rational number.

T – 1 min
S – Rational number

Ans.

35. Every negative rational number is less than zero.

T – 1 min
S – Rational number

Ans.

36. When a rational number is divided by a rational number, the result is always a rational number.

T – 1 min
S – Rational number

Ans.

37. We can divide zero by any rational number.

T – 1 min
S – Rational number

Ans.

38. When a rational number is multiplied by a rational number, the result is always a rational number.

T – 1 min
S – Rational number

Ans.

39. Rational numbers are commutative under division.

T – 1 min
S – Rational number

Ans.

40. Rational numbers are always associative under multiplication.

T – 1 min
S – Rational number

Ans.

Questions 41-44, Arrange the following rational numbers in descending order:

41. $\frac{-5}{4}, \frac{3}{-8}, \frac{-7}{6}, \frac{6}{-12}$

T – 1 min
S – Rational number

Ans.

42. $\frac{-5}{-8}, \frac{-15}{16}, \frac{21}{-24}, \frac{-31}{32}$

T – 1 min
S – Rational number

Ans.

43. $\frac{-3}{10}, \frac{7}{15}, \frac{-11}{20}, \frac{17}{-30}$

Ans.

44. $\frac{-3}{4}, \frac{5}{-12}, \frac{-7}{16}, \frac{9}{24}$.

T – 1 min
S – Rational number

Ans.

45. $\frac{-11}{9} \times \frac{-54}{44}$

T – 1 min
S – Rational number

Ans.

46. (a) 7ym – 2ym = _____ m
(b) 43 gl – 10 gl – 12gl – 21gl = _____ l

T – 1 min
S – Linear equation

Ans.

47. (a) 3p – p + 2 = _____
(b) 8s – 2s – 17 = _____

T – 1 min
S – Linear equation

Ans.

48. (a) tg + 2tg = _____ g
(b) Rs 3k + Rs 21k + Rs 23k + Rs k = Rs _____

T – 1 min
S – Linear equation

Ans.

Questions 49-50, Factorize each of the following expression.

49. (a) 3p + p + 2 = _____
(b) 75 + 195 + 17 = _____

T – 2 min
S – Linear equation

Ans.

50. (a) 9k – k – 3k = _____
(b) 45a – 12a – 25a = = _____

Ans.

30

Opening Window

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. Subtract the sum of $\frac{-3}{10}$ and $\frac{5}{8}$ from the sum of $\frac{4}{15}$ and $\frac{2}{-5}$.

T – 1 min
S – Rational number

Ans.

52. Write the numerator and the denominator of each of the following:

(a) $\frac{-5}{6}$ (b) $\frac{2}{-3}$

T – 1 min
S – Rational number

Numerator _____
Denominator _____

Numerator _____
Denominator _____

Ans.

53. Write the following rational numbers with positive numerators.

(a) $\frac{-3}{11}$ (b) $\frac{-5}{-7}$

T – 1 min
S – Rational number

Ans.

54. Express $\frac{5}{6}$ as a rational number with the denominator 36.

T – 1 min
S – Rational number

Ans.

55. Express $\frac{3}{5}$ as a rational number with the numerator –45.

T – 1 min
S – Rational number

Ans.

56. Find the x, If $\frac{-1}{5} = \frac{x}{125}$.

T – 1 min
S – Rational number

Ans.

57. Fill in the blanks: $\frac{7}{-19} = \frac{63}{}$

T – 1 min
S – Rational number

Ans.

58. Solve $\frac{2+x}{3+x} = 5$

T – 1 min
S – Linear equation

Ans.

59. $\frac{0.3+0.7x}{x} = 0.85$ Find X?

T – 1 min
S – Linear equation

Ans.

Factorise the following:

60. $1 + x + xy + x^2y$

T – 1 min
S – Linear equation

Ans.

61. $8(4x + 5y)^2 - 12(4x + 5y)$

T – 1 min
S – Linear equation

Ans.

62. $x^3 - 3x^2 + x - 3$

T – 1 min
S – Linear equation

Ans.

63. $16x^2 - 169y^2$

T – 1 min
S – Linear equation

Ans.

64. $3x^2 - 4x - 4$

T – 1 min
S – Linear equation

Ans.

65. Solve $\frac{3x+8}{4x+5}=\frac{6x+1}{8x+7}$

T – 1 min
S – Linear equation

Ans.

66. Write the $\frac{36}{60}$ in the standard form.

T – 1 min
S – Rational numbers

Ans.

67. Find the sum of $\frac{-5}{24}$ and $\frac{11}{24}$.

T – 1 min
S – Rational numbers

Ans.

68. Evaluate. $\frac{7}{-10}+\frac{-11}{15}+\frac{17}{20}$

T – 1 min
S – Rational numbers

Ans.

69. Subtract : $\frac{3}{16}$ from $\frac{-5}{8}$.

T – 2 min
S – Rational numbers

Ans.

70. Evaluate. $\left(\frac{5}{12}-\frac{11}{18}\right)-\left(\frac{-9}{8}+\frac{7}{15}\right)$

T – 2 min
S – Rational numbers

Ans.

71. Verify: x + y = y + x by taking $x=\frac{-3}{5}, y=\frac{5}{3}$.

T – 2 min
S – Rational numbers

Ans.

72. The number of boys and girls in a class are in the ratio 7 : 5. The number of boys is 8 more than the number of girls. What is the total class strength?

T – 2 min
S – Linear equations

Ans.

73. Three consecutive integers are such that when they are taken in increasing order and multiplied by 2, 3 and 4 respectively, they add up to 74. Find these numbers

T	– 2 min
S	– Linear equations

Ans.

74. One number is 3 times another number. If 15 is added to both the numbers, then one of the new numbers becomes twice that of the other new number. Find the numbers.

T	– 2 min
S	– Linear equations

Ans.

75. Arrange the following rational numbers in descending order.

$$\frac{-2}{5}, \frac{1}{5}, \frac{-5}{12}$$

T	– 2 min
S	– Rational numbers

To equalise their denominators we multiply :

Ans.

76. Which of the two rational numbers is smaller?

$$\frac{-5}{8}, 0$$

T	– 2 min
S	– Rational numbers

Ans.

77. Which of the two rational numbers is greater?
$\frac{-4}{15}, \frac{-3}{-8}$

T – 2 min
S – Rational numbers

Ans.

78. Represent the number $\frac{7}{4}$ on the number line.

T – 3 min
S – Rational numbers

Ans.

79. Find three rational numbers between $\frac{1}{4}$ and $\frac{1}{2}$.

T – 3 min
S – Rational numbers

Ans.

80. Find any two rational numbers between $\frac{-5}{6}$ and $\frac{5}{8}$.

T – 3 min
S – Rational numbers

Ans.

20

Opening Window

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. A post has half of its lengths in mud, one third of its length in water and the remaining 3 metres is above water. Find the whole length of the post.

T – 2 min
S – Rational numbers

Ans.

82. Product of two numbers is $8\frac{1}{3}$ and one of them is $-4\frac{2}{3}$. Find their sum.

T – 2 min
S – Rational numbers

Ans.

83. Asha spends $\frac{1}{4}$ of her money in one shop. She spends $\frac{2}{3}$ of what was left with her in another shop. At the end, she had Rs 100 with her. How much did she have in the beginning?

T – 2 min
S – Rational numbers

Ans.

84. A milkman has 30 litres of milk in a can. He sold $25\frac{1}{2}$ litres of it. How much milk was left in the can?

T	– 2 min
S	– World's problem in rational number

Ans.

85. Sum of three rational numbers is $\frac{34}{5}$. Two of them are $\frac{13}{2}$ and $\frac{14}{5}$, find the third rational number.

T	– 2 min
S	– World's problem in rational number

Ans.

86. In a colony two thirds of the total vehicle are scooters. Three fourths of the remaining are bicycles. The rest are 120 cars. How many total vehicles are there?

T	– 2 min
S	– Rational numbers

Ans.

87. A person gave $\frac{1}{2}$ of the money to his wife and $\frac{1}{3}$ to his son. The remaining Rs 40,000 he gave to his daughter. How much money did he have?

T	– 2 min
S	– Rational numbers

Ans.

88. The denominator of a rational number is greater than its numerator by 3. If 3 is subtracted from the numerator and 2 is added to its denominator, the new number becomes $\frac{1}{5}$. Find the original number?

T – 2 min
S – Rational numbers

Ans.

89. The cost of $20\frac{3}{4}$ litres of petrol is Rs 830. What is the cost of one litre of petrol?

T – 2 min
S – Rational numbers

Ans.

90. The product of two rational numbers is $\frac{3}{4}$. If one of the numbers is $-\frac{12}{5}$, find the other.

T – 2 min
S – Rational numbers

Ans.

91. Sum of the digits of a two digits number is 13. If 27 is subtracted from it, the digits are inter changed. Find the original number.

T – 2 min
S – Linear equation

Ans.

92. Sum of a three digit number are in the ratio 1 : 2 : 4. If 594 is added to the number, the digits are in the reverse order. Find the number.

T – 2 min
S – Linear equation

Ans.

93. Sum of the digits of a two digit number is 8. The given number exceeds, the number obtained by inter changing the digits by 18. Find the given number.

T – 2 min
S – Linear equation

Ans.

94. Sum of the digits of a two digit number is 10. The number obtained by inter changing the digits exceeds, the given number by 36. Find the given number.

T – 2 min
S – Linear equation

Ans.

95. The difference between a number of three digits A, B and C and the number obtained by reversing the digits is 198. Find the difference of A and C.

T – 2 min
S – Linear equation

Ans.

96. Simplify:
(a) $x^2 (x - x^3) - 2x (x + x^3) - 3 (x^4 - 2x)$
(b) $ab^2(a^2 - b) + a^2b (2ab - 3a^2) - a^3 (1 + 3b)$.

T – 3 min
S – Linear equation

Ans.

97. Simplify and verify the result for $x = 2, y = 1, z = -1$
(a) $(x + yz) (y + zx) (z + xy)$
(b) $x (x^2 + y + z) - y(x + y^2 + z) + z(x - y + z^2)$

T – 3 min
S – Linear equation

Ans.

98. Simplify :
(a) $(2x^2 + 4x + 5) (x - 1) - (3x^2 + x - 1) (x + 1)$
(b) $(x^2 - 3x + 4) (x + 1) - (2x^2 - x + 3) (x - 1)$

T – 3 min
S – Linear equation

Ans.

99. Solve $\frac{6x+7}{3x+2}=\frac{4x+5}{2x+3}$

T	– 3 min
S	– Linear equation

Ans.

100. 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.

06

Opening Window

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. Verify the following expresions (for Question 101 and 102)

$$\left(\frac{-2}{3}+\frac{5}{7}\right)+\frac{-1}{6}=\frac{-2}{3}+\left(\frac{5}{7}+\frac{1}{6}\right)$$

Ans.

102. $\left(\frac{-5}{2}\times-\frac{7}{4}\right)\times\frac{1}{2}=-\frac{5}{2}\times\left(\frac{-7}{4}\times\frac{1}{2}\right)$

Ans.

103. Prove the closure property of rational number.

Ans.

104. Solve the following equations.

(a) $\frac{x-1}{2}-\frac{x-2}{3}=1$

(b) $\frac{x+2}{6}-\frac{x-3}{3}=x$

Ans.

105. Fourteen added to thrice a whole number gives 56. Find the number.
Let the number be x.

Ans.

106. Rohan thought of a number, doubled it and subtracted 25 from it. The result was 49, find the number.

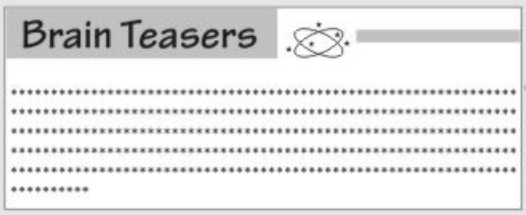
Ans.

Tools at a glance

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

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

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



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.

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
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