Grade 07
Unit 10

Maths

Course Outline

- Exponents and Powers
- Symmetry

MAT (Monthly Achievement Tests)

Short Code: 447308

Test ID: NMM07U100

SOUVENIR INFOTECH

Guide Lines

1.Each set consists of:

50 | Warm-up/Foundation Questions

30 | Regular Questions

20 | Thinking Ability 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 Warm-up/Foundation Questions

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.

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. $a^0 =$

(a) 1 (b) a

(c) $\frac{1}{a}$ (d) none of these

T – 1 min
S – Exponents and powers

Ans.

2. $\left(\frac{-3}{4}\right)^0$

(a) $\frac{-4}{3}$ (b) $\frac{3}{4}$

(c) 0 (d) 1

T – 1 min
S – Exponents and powers

Ans.

3. Simplify $\left\{\left(\frac{-3}{2}\right)^2\right\}^{-3}$

(a) $\frac{-64}{729}$ (b) $\frac{64}{729}$

(c) $\frac{64}{323}$ (d) $\frac{64}{243}$

T – 1 min
S – Exponents and powers

Ans.

4. $(-8)\times(-8)\times(-8)\times(-8)\times(-8)$ express in power notation

(a) $(-8)^4$ (b) $(-8)^6$

(c) $(-8)^{10}$ (d) $(-8)^5$

T – 1 min
S – Exponents and powers

Ans.

5. $\left(\frac{-1}{6}-\frac{-1}{5}\right)^{-1}$

(a) 30 (b) -30

(c) 50 (d) none of these

T – 1 min
S – Exponents and powers

Ans.

6. Express $\left(\frac{1}{4}\right)^{-1}$ as a rational number.

(a) 4 / 3 (b) 1 / 4

(c) 4 / 1 (d) none of these

T – 1 min
S – Exponents and powers

Ans.

7. $\left(\frac{-1}{2}\right)^{3}$

(a) $\frac{-1}{8^2}$ (b) $\frac{-1}{4}$

(c) $\frac{1}{8}$ (d) $\frac{-1}{8}$

T – 1 min
S – Exponents and powers

Ans.

8. $(9)^0 =$

(a) 1 (b) 0

(c) 9 (d) $\frac{1}{9}$

T – 1 min
S – Exponents and powers

Ans.

9. A square has a rotational symmetry of order

(a) 6 (b) 3

(c) 2 (d) 4

T – 1 min
S – Symmetry

Ans.

10. An equilateral triangle has _____ lines of symmetry.

(a) 1 (b) 3

(c) 2 (d) None of these

T – 1 min
S – Symmetry

Ans.

True or False

11. The number of times a figure fits in to itself in one complete rotation is called the rotational symmetry.

T – 1 min
S – Symmetry

Ans.

12. All squares are congruent.

T – 1 min
S – Symmetry

Ans.

13. If two triangle are equal in area, they are congruent.

T – 1 min
S – Symmetry

Ans.

14. $4^3 \div 4^2 = 4^5$

T – 1 min
S – Exponents and powers

Ans.

15. $5^2 \times 5^4 = 5^6$

T – 1 min
S – Exponents and powers

Ans.

16. $2^7 \times 2^8 = 2^{15}$

T – 1 min
S – Exponents and powers

Ans.

17. (–1) raised to the power three is negative.

T – 1 min
S – Exponents and powers

Ans.

18. (–1) raised to the power four is negative.

T – 1 min
S – Exponents and powers

Ans.

19. $(20+20)^{10} = 20^{10} + 20^{10}$

T – 1 min
S – Exponents and powers

Ans.

20. $\left\{\left(\frac{1}{3}\right)^6\right\}^6$ is the reciprocal of 3^{36}

T – 1 min
S – Exponents and powers

Ans.

Fill in the blanks

21. $\left(\frac{a}{b}\right)^{\circ} =$ _____ .

T – 1 min
S – Exponents and powers

Ans.

22. $3^3 \times 3^3 = (3)^c$

T – 1 min
S – Exponents and powers

Ans.

23. $(-5)^4 \times (-5)^6 = (-5)^c$

T – 1 min
S – Exponents and powers

Ans.

24. $\left(\frac{1}{3}\right)^5 \times \left(\frac{1}{3}\right)^4 = \left(\frac{1}{3}\right)^c$

T – 1 min
S – Exponents and powers

Ans.

25. $\left(\frac{5}{4}\right)^8 \div \left(\frac{5}{4}\right)^5 = \left(\frac{5}{4}\right)^c$

T – 1 min
S – Exponents and powers

Ans.

26. $\left(\frac{-2}{3}\right)^4 \times \left(\frac{-2}{3}\right)^5 = \left(\frac{-2}{3}\right)^c$

T – 1 min
S – Exponents and powers

Ans.

27. $\left(\frac{-1}{7}\right)^7 \div \left(\frac{-1}{7}\right)^3 = \left(\frac{-1}{7}\right)^c$

T – 1 min
S – Exponents and powers

Ans.

28. A rectangle has _____ lines of symmetry.

T – 1 min
S – Symmetry

Ans.

29. Two rectangles are congruent if they have the same _____ and _____.

T – 1 min
S – Symmetry

Ans.

30. A scalene triangle has _____.

T – 1 min
S – Symmetry

Ans.

Express each of the following in power notation:

31. $-1 \times -1 \times -1 \times -1 \times -1 \times -1$

T – 1 min
S – Exponents and powers

Ans.

32. $\frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3}$

T – 1 min
S – Exponents and powers

Ans.

33. $\frac{-4}{3} \times \frac{-4}{3} \times \frac{-4}{3} \times \frac{-4}{3}$

T – 1 min
S – Exponents and powers

Ans.

34. $-5 \times -5 \times -5$

T – 1 min
S – Exponents and powers

Ans.

Express in power notation:

35. $\frac{-16}{729}$

T – 1 min
S – Exponents and powers

Ans.

36. $\frac{1}{2401}$

T – 1 min
S – Exponents and powers

Ans.

37. $\frac{14641}{20736}$

T – 1 min
S – Exponents and powers

Ans.

38. Name any two figures that have both line symmetry and rotational symmetry.

T – 1 min
S – Symmetry

Ans.

39. Number of symmetry of a isosceles triangle.

T – 1 min
S – Symmetry

Ans.

40. Draw the line of symmetry of rhombus.

T – 1 min
S – Symmetry

Ans.

Simple questions

41. Express 343 in exponential notation?

T – 1 min
S – Exponents and powers

Ans.

Questions 42–43. Which one is greater?

42. 4^3 or 3^4

T – 1 min
S – Exponents and powers

Ans.

43. 2^{100} or 100^2

T – 1 min
S – Exponents and powers

Ans.

Questions 44–45. Simplify the following.

44. $(7^{50})^2$

T – 1 min
S – Exponents and powers

Ans.

45. $(5^3)^7$

T – 1 min
S – Exponents and powers

Ans.

Questions 46–47. Expand the following.

46. $5^6 \div (-2)^6$

T – 1 min
S – Exponents and powers

Ans.

47. $(-3)^4 \times (-2)^4$

T – 1 min
S – Exponents and powers

Ans.

48. Define centre of rotation..

T – 1 min
S – Symmetry

Ans.

49. Define angle of rotation.

T – 1 min
S – Symmetry

Ans.

50. Define angle of symmetry.

T	– 1 min
S	– Symmetry

Ans.

30 Regular Questions

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.

Questions 51–52. Express the powers of 10 in the exponential form.

51. 70532

T – 1 min
S – Exponents and powers

Ans.

52. 275

T – 1 min
S – Exponents and powers

Ans.

53. Express in the standard form.
3430000

T – 1 min
S – Exponents and powers

Ans.

54. Express 729 as a power of 3?

T – 1 min
S – Exponents and powers

Ans.

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

T – 1 min
S – Exponents and powers

Ans.

56. Simplify and write in exponential form.
$2^9 \div 2^3$

T – 1 min
S – Exponents and powers

Ans.

57. $(7^2)^{10}$

T – 1 min
S – Exponents

Ans.

58. Expand by expressing powers of 10 in the exponential form.
176428

T – 1 min
S – Exponents and powers

Ans.

59. Draw a line of symmetry of hexagon?

T – 1 min
S – Symmetry

Ans.

Questions 60–61. Express the powers of 10 in the exponential form.

60. 70532

T – 1 min
S – Exponents and powers

Ans.

61. 275

T – 1 min
S – Exponents and powers

Ans.

Questions 62–63. Express in the standard form.

62. 3430000

T – 1 min
S – Exponents and powers

Ans.

63. Solve $\frac{3}{4}y + 3 = 21$

T – 1 min
S – Exponents and powers

Ans.

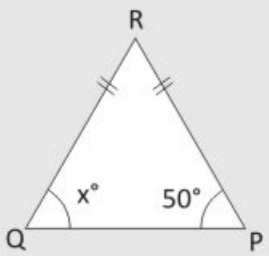
64. A man goes 15m due west and the 8m due north. How far is he from the starting point?

T	– 1 min
S	– Symmetry

Ans.

Questions 65–66. Find the angle x in each figure.

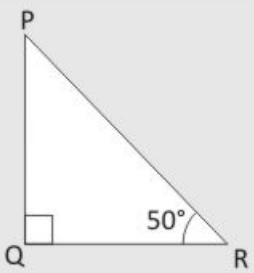
65.



T	– 1 min
S	– Symmetry

Ans.

66.



T	– 2 min
S	– Symmetry

Ans.

67. Evaluate the following:
(a) 6^3 (b) 8^3

T – 2 min
S – Exponents and powers

Ans.

68. Write the following in exponential form:
(a) $\left(\frac{-5}{6}\right)\times\left(\frac{-5}{6}\right)\times\left(\frac{-5}{6}\right)$ (b) $\frac{13}{15}\times\frac{13}{15}\times\frac{13}{15}$

T – 2 min
S – Exponents and powers

Ans.

69. Express each of the following numbers in exponential form:
(a) 128 (b) 3125

T – 2 min
S – Exponents and powers

Ans.

70. Find the value of:
(a) $(-1)^{37}$ (b) $(-42)^4$

T – 2 min
S – Exponents and powers

Ans.

71. Simplify: $\left[\left(\frac{-3}{5}\right)^3\right]^2$

T – 2 min
S – Exponents and powers

Ans.

72. Simplify and express in exponential form:
(a) $\left(\frac{8}{15}\right)^5 \times \left(\frac{8}{15}\right)^7$ (b) $\left(\frac{-7}{12}\right)^4 \times \left(\frac{-7}{12}\right)^6$

T – 2 min
S – Exponents and powers

Ans.

73. Evaluate and express in exponential form:

(a) $\left(\frac{-5}{9}\right)^6 \times \left(\frac{-5}{9}\right)^4$ (b) $\left(\frac{12}{17}\right)^8 \div \left(\frac{12}{17}\right)^5$

T – 2 min
S – Exponents and powers

Ans.

74. Simplify:

(a) $\left(\frac{7}{10}\right)^4 \div \left(\frac{7}{10}\right)^6$ (b) $\left(\frac{-5}{12}\right)^5 \div \left(\frac{-5}{12}\right)^7$

T – 2 min
S – Exponents and powers

Ans.

75. Evaluate and express the result in exponential form:

(a) $\left[\left(\frac{-3}{4}\right)^4\right]^5$ (b) $\left[\left(\frac{7}{18}\right)^3\right]^8$

T – 2 min
S – Exponents and powers

Ans.

Match the following

T – 10 min
S – Symmetry

	Column I	***Column II***
76.	Scalene triangle	(i) fine line of Symmetry
77.	Equilateral triangle	(ii) Six line of Symmetry
78.	Square	(iii) three line of symmetry
79.	Regular Pentagon	(iv) Four line of symmetry
80.	Regular Hexagon	(v) No line of symmetry

20 Thinking Ability Questions

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. Which one of the two rational numbers, $\frac{4^2}{5}$ and $\left(\frac{4}{5}\right)^2$ is smaller and how much?

T – 1 min
S – Exponents and powers

Ans.

82. By what number $\left(\frac{-3}{5}\right)^2$ be multiplied so that the product becomes $\left(\frac{3}{5}\right)^4$?

T – 1 min
S – Exponents and powers

Ans.

83. By what number $\left(\frac{-4}{7}\right)^3$ be divided so that the quotient is $\frac{16}{49}$?

T	– 1 min
S	– Exponents and powers

Ans.

84. Divide 78125 by 10000 and express the result in exponential form.

T	– 2 min
S	– Exponents and powers

Ans.

85. Express $\left(\frac{3}{4}\right)^{-3}$ as power of rational number with positive exponent.

T	– 2 min
S	– Exponents and powers

Ans.

86. Using the laws of exponents, express each of the following as rational number with positive exponents:

(a) $(2^5 \div 2^8) \times 2^{-7}$ (b) $2^{-3} \times (-7)^{-3}$

T	– 2 min
S	– Exponents and powers

Ans.

87. Express $\left(\frac{7}{3}\right)^6$ as power of rational number with negative exponents.

T	– 2 min
S	– Exponents and powers

Ans.

88. By what number should we multiply $(-8)^{-1}$ so that the product may be equal to 10^{-1}?

T	– 2 min
S	– Exponents and powers

Ans.

89. By what number should $\left(\frac{-3}{2}\right)^{-3}$ be divided so that the quotient may be $\left(\frac{2}{3}\right)$?

T – 2 min
S – Exponents and powers

Ans.

90. Express the following in the form $k \times 10^n$ with the given value of n:

(a) 98000000, $n = 5$

$= 980 \times 10^5$

(b) 0.000000000091, $n = -11$

$= 9.1 \times 10^{-11}$

(c) 602000000000000000000, $n = 22, 23$

T – 2 min
S – Exponents and powers

Ans.

91. Express the following numbers in the form $k \times 10^n$, where k is a number and n is an integer.

(a) 3049700000 (b) 0.0000837

T – 2 min
S – Exponents and powers

Ans.

92. Simplify:

(a) $\left(\frac{1}{4}+\frac{3}{5}\right)^3$ (b) $\left(\frac{5}{7}+\frac{3}{2}\right)^2$

T – 2 min
S – Exponents and powers

Ans.

93. Evaluate and express the result in exponential form.

(a) $\left[\left(\frac{-3}{4}\right)^4\right]^5$ (b) $\left[\left(\frac{7}{18}\right)^3\right]^8$

T – 3 min
S – Exponents and powers

Ans.

Evaluate the following

94. $3^5 \times 3^9 =$

T – 3 min
S – Exponents and powers

Ans.

95. $4^8 \div 4^3 =$

T – 3 min
S – Exponents

Ans.

96. $(4^3)^2 =$

T – 3 min
S – Exponents and powers

Ans.

97. $(6^4)^2 \times 6^9 =$

T – 3 min
S – Exponents and powers

Ans.

98. $(9^3)^2 \div 9^3 =$

T – 3 min
S – Exponents and powers

Ans.

Find the rotational Symmetry of following

99. A circle

T	– 3 min
S	– Symmetry

Ans.

100. A triangle

T	– 3 min
S	– Symmetry

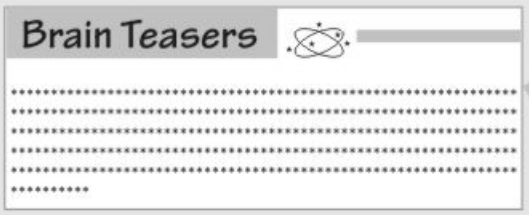
Ans.

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