Grade 09
Unit 08

Maths

Course Outline

- Circle
- Constructions
- Surface Areas and Volumes

MAT
(Monthly Achievement Tests)

Short Code: 447310

Test ID: NMM09U080

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.

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. A solid generated by revolution of a rectangle about one of its side is known as:
   (a) cuboid (b) rectangle
   (c) cylinder (d) sphere

   T – 1 min
   S – Cylinder
   Ans.

2. The diagonal of a cube is $\sqrt{12}$ cm. then its edge is
   (a) 4 cm (b) 6 cm
   (c) 3 cm (d) 2 cm

   T – 1 min
   S – Cube
   Ans.

3. Find the slant height of the cone whose radius 9 cm and height is 12 cm
   (a) 14 cm (b) 21 cm
   (c) 15 cm (b) 12 cm

   T – 1 min
   S – Slant height
   Ans.

4. Sum of the either pair of the opposite angles of a cyclic quadrilateral is
   (a) 90° (b) 180°
   (c) 360° (d) 270°

   T – 1 min
   S – Quadrilateral
   Ans.

5. Angle in a semicircle is_____ .
   (a) 90° (b) 180°
   (c) 270° (d) 360°

   T – 1 min
   S – Quadrilateral
   Ans.

6. Surface area of a box whose length is 30 cm breath 15 cm and height 20 cm is

(a) 3300 cm^2 (b) 2900 cm^2

(c) 2700 cm^2 (d) 3000 cm^2

T – 1 min
S – Surface area

Ans.

7. A triangle whose sides are 42 cm, 34 cm and 20 cm in length, find the area.

(a) 336 cm^2 (b) 335 cm^2

(c) 396 cm^2 (d) 346 cm^2

T – 1 min
S – Area of triangle

Ans.

8. Volume of the spherical shell is

(a) $\frac{2}{3}\pi r^3$ (b) $\frac{4}{3}\pi(R^3 - r^3)$

(c) $\frac{2}{3}\pi(R^3 - r^3)$ (d) $\frac{\pi}{3}(R^2 - r^2)h$

T – 1 min
S – Volume of spherical shell

Ans.

9. Find the area of the triangle two sides of which are 16 cm and 22 cm and perimeter is 64 cm.

(a) $32\sqrt{30}$ cm^2 (b) $37\sqrt{7}$ cm^2

(c) $36\sqrt{10}$ cm^2 (d) $46\sqrt{5}$ cm^2

T – 1 min
S – Area of triangle

Ans.

10. Find the third side of a triangle whose other two sides are 18 cm, and 24 cm and perimeter is 65 cm

(a) 24 cm (b) 23 cm

(c) 22 cm (d) 21 cm

T – 1 min
S – Perimeter

Ans.

11. Through three non-collinear points, how many circles can be drawn ?

(a) Infinite (b) Three

(c) Two (d) One

T – 1 min
S – Circles

Ans.

12. The circle and its interior is known as

(a) sector (b) minor arc

(c) circular region (d) major arc

T – 1 min
S – Circles

Ans.

13. Perpendicular from the centre of a circle to a chord _____ the chord.

(a) bisect (b) equal

(c) similar (d) divided it into 1 : 3

T – 1 min
S – Circles

Ans.

14. Sector is the region between chord and _____ joining them.
(a) centre (b) corresponding are
(c) angle (d) two radii

T – 1 min
S – Euclid's geometry
Ans.

15. It is a collection of all points in a plane, which are equidistant from a fixed point in the plane
(a) sphere (b) cube
(c) circle (d) cuboid

T – 1 min
S – Circles
Ans.

16. Equal chords of a circle subtend _____ at the centre.
(a) equal sides (b) equal arc
(c) equal angles (d) equal segments

T – 1 min
S – Circles
Ans.

17. Angles in the same segment of a circle are
(a) equal (b) not equal
(c) not determined

T – 1 min
S – Circles
Ans.

18. Volume of a cylinder is
(a) $\pi r^2 h$ (b) $\pi r^3 h$
(c) πrh (d) none

T – 1 min
S – Surface area
Ans.

19. Volume of a cuboid
(a) base area × height (b) (port area)^2
(c) $\pi \times$ base area $\times$ height (d) none

T – 1 min
S – Surface area and volume
Ans.

20. Find the volume of a hemiphers where radius of hemisphere in 3 cm.
(a) 18 π cm^3 (b) 54 π cm^3
(c) 9 π cm^3 (d) none

T – 1 min
S – Surface area and volume
Ans.

Fill in the blanks :

21. The angle subtended by an arc at the centre is _____ the angle subtended by it at any point on the remaining part of the circle.

T – 1 min
S – Circles
Ans.

22. Angles in the same segment of a circle are _____ .

T – 1 min
S – Circles

Ans.

23. Circles haring same centre are said to be_____ .

T – 1 min
S – Circles

Ans.

24. One fourth of a circular disc is called a _____ .

T – 1 min
S – Circles

Ans.

25. Curved surface area of the cylinder is _____ .

T – 1 min
S – Curved surface area

Ans.

26. *s* is called _____ of triangle.

T – 1 min
S – Surface area

Ans.

27. Segment of a circle is the region between an arc and _____ of the circle.

T – 1 min
S – Circle

Ans.

28. Angle in a semicircle is a _____ .

T – 1 min
S – Circle

Ans.

29. If two chords of a circle are equal, then their corresponding arcs are _____ .

T – 1 min
S – Circle

Ans.

30. Chords equidistant from the centre of a circle is _____ .

T – 1 min
S – Circle

Ans.

True or False

31. Total surface area of a cylinder $= 2\pi r(r + h)$.

T – 1 min
S – Surface area

Ans.

32. Solid generated by stacking a number of circular sheets in a vertical pile is known as right circular cylinder.

T – 1 min
S – Volumes

Ans.

33. If a circle is divided into three equal area, each is a major arc.

T – 1 min
S – Circle

Ans.

34. Number of points on a circle is infinite.

T – 1 min
S – Circle

Ans.

35. Sphere is a solid figure.

T – 1 min
S – Sphere

Ans.

36. Equal chords of a circle subtend equal angles at the centre.

T – 1 min
S – Circle

Ans.

37. If two circles intersect at two points, then their centres lie on bisector of the common chord.

T – 1 min
S – Circle

Ans.

38. Chords of congruent circles subtend equal angles at their centres, then the chord are similar

T – 1 min
S – Circle

Ans.

39. The line drawn through the centre of a circle to bisect a chord is perpendicular to the chord.

T – 1 min
S – Circle

Ans.

40. If two arcs of a circle are congruent, then their corresponding chords are equidistant.

T – 1 min
S – Circle

Ans.

Simple Questions

41. Find the volume of a hemispherical bowl whose radius is 3.5 cm.

T – 1 min
S – Volume of hemisphere

Ans.

42. The length, breadth and light of a room are 6 m, 5 m and 4 m respectively. Find the total surface area of the cuboid ?

T – 1 min
S – Surface area

Ans.

43. Find the diagonal of the cube whose side is 12 cm.

T – 1 min
S – Diagonal of the cube

Ans.

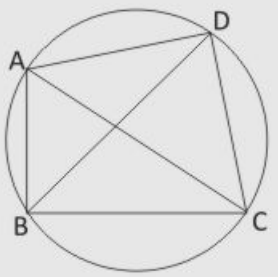
44. Construct a triangle ABC in which BC = 7cm, $\angle B = 75°$ and AB + AC = 13 cm.

T	– 1 min
S	– Constructions

Ans.

45. In the figure, *ABCD* is a cyclic quadrilateral in which *AC* and *BD* are its diagonals. If $\angle DBC = 55°$ and $\angle BAC = 45°$, find $\angle BCD$.

T	– 1 min
S	– Circle



Ans.

46. Curved surface area of a right, circular cylinder of height 35 cm is 121 cm^2. Find the radius of its base.

T	– 1 min
S	– Curve surface area

Ans.

47. Find the volume of a spherical ball of radius 14 cm.

T	– 1 min
S	– Volume

Ans.

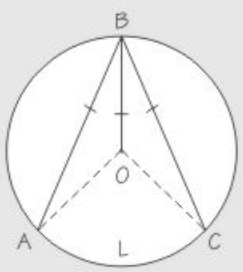
48. The radius of a circle is 13 cm and the length of its chords is 10 cm. Find the distance of the chord from the centre ?

T	– 1 min
S	– Circle

Ans.

49. In the figure $AB = CB$ and O is the centre of the circle. Prove BO bisects $\angle ABC$.

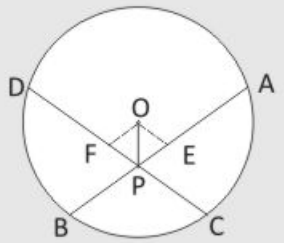
T	– 1 min
S	– Circle



Ans.

50. In the figure, O is the centre of a circle and PO bisects $\angle APD$. Prove that $AB = CD$.

T	– 1 min
S	– Circle



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. The diameter of a metallic ball is 4.2 cm what is the mass of the ball, if the density of the metal is 8.9 g per cm^2

T	– 1 min
S	– Volume of sphere

Ans.

52. The capacity of a closed cylindrical vessel of height 1 m is 15.4 litres. How many square meters of metal sheet would be needed to make it ?

T	– 1 min
S	– Volume of cylinder

Ans.

53. Find the volume of the right circular cone with radius 2.1 cm and height 10 cm.

T	– 1 min
S	– Volume

Ans.

54. A conical pit top having diameter 3.5 m is 12 m deep. what is its capacity in kilolitre.

T	– 1 min
S	– Surface area of sphere

Ans.

55. Find the surface area of sphere of diameter 35 m

T	– 1 min
S	– Surface area of sphere

Ans.

Questions 56-57, the inner diameter of circular well is 8.5 m. It is 10 m deep.

56. Find it's inner curved surface area

T	– 2 min
S	– Curved surface

Ans.

57. The cost of plastering this curved surface at the rate of Rs 40 per m^2

Ans.

Questions 58-59, If the lateral surface of a cylinder of height 5 cm is 94.2 cm^2

58. Find the radius of the base lateral surface area of cylinder $= 2\pi rh$

T	– 2 min
S	– Lateral surface area

Ans.

59. Find the volume of the cylinder.

T	– 1 min
S	– Volume

Ans.

60. the surface area of a cuboid length = 80 cm, Breadth = 40 cm, Height = 20cm.

T	– 2 min
S	– Surface area of cuboid

Ans.

61. Find the lateral surface area of the cubes whose side is 10 cm?

T	– 1 min
S	– Lateral surface area

Ans.

62. Find the curved surface area of a cylinder of length 25 cm with a 3.5 cm radius.

T	– 1 min
S	– Curved surface area

Ans.

63. If a line intersects two concentric circles (circles with the same centre) with centre O at A, B, C and D. Prove that $AB = CD$.

T	– 1 min
S	– Circle

Ans.

64. If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord.

T	– 1 min
S	– Circle

Ans.

65. Find the area of a circle. If perimeter of the circle is 512 cm.

T	– 1 min
S	– Circle

Ans.

66. *ABCD* is a rectangle and *P*, *Q*, *R* and *S* are mid points of the sides *AB*, *BC*, *CD* and *DA* respectively. Show that the quadrilateral *PQRS* is a rhombus.

T	– 2 min
S	– Constructions

Ans.

Questions 67-68, write true or false. give reasons for your answer:

67. A circle has only finite number of equal chords.

T	– 4 min
S	– Circle

Ans.

68. If a circle is divided into three equal arcs each is a major arc.

Ans.

69. If a diagonals of a cyclic quadrilateral are diameters of the circle through the vertices of the quadrilateral. Prove that it is a rectangle.

T	– 2 min
S	– Quadrilateral

Ans.

70. Construct a triangle XYZ in which $\angle Y = 30°$, $\angle Z = 90°$ and $XY + YZ + ZX =$ 11cm.

T	– 2 min
S	– Constructions

Ans.

71. Diameter of the base of a cone is 12 cm and its slant height is 10 cm. Find the curved surface area of the cone?

T	– 2 min
S	– Curved surface area

Ans.

72. Diameter of a sphere is 1.4 cm. Find its surface area.

T	– 2 min
S	– Surface area

Ans.

73. The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm. How many litres of water can it hold?

T	– 2 min
S	– Volume

Ans.

74. A right triangle *ABC* with its sides 5 cm, 12 cm and 13 cm is revolved about the side 12 cm. Find the volume of the solid so obtained.

T	– 2 min
S	– Volume of a cone

Ans.

75. How much litres of milk can a hemispherical bowl of diameter 10.5 cm hold?

T	– 2 min
S	– Volume of hemispherical

Ans.

76. Find the capacity in litres of a conical vessel with radius 7 cm, slant height 25 cm.

T	– 2 min
S	– Slant height

Ans.

77. Find the volume of a sphere surface area is 154 cm^2.

T	– 2 min
S	– Volume of sphere

Ans.

Questions 78-79, twenty seven gold iron sphere, each of radius surface area 's' are melted to form a sphere with surface area s'

78. Radius r' of the new sphere

T	– 2 min
S	– Surface area

Ans.

79. Ratio of s and s'

T	– 2 min
S	– Ratio

Ans.

80. A cuboidal water tank is 6 m long, 5 m wide and 4.5 m deep. How many litres of water can it hold? [1 $m^3 = 1000\ l$]

T	– 2 min
S	– Volume

Ans.

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. The height and the slant height of a cone are 21 cm and 28 cm respectively. Find the volume of the cone ?

T – 2 min
S – Volume of cone

Ans.

82. A hollow sphere, in which the circus motorcyclist performs his stunts, has a diameter of 7 m. Find the area available to the motorcyclist for riding.

T – 2 min
S – Surface area

Ans.

83. A hemispherical bowl has a radius of 1.4 cm. What would be the volume of water it would contain?

T – 2 min
S – Hemisphere

Ans.

84. Show that of all line segments drawn from a given point not on it, the perpendicular line segment is shortest.

T – 2 min
S – Construction

Ans.

85. Prove that a cyclic parallelogram is a rectangle.

T – 2 min
S – Circle

Ans.

86. The length of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at distance 4 cm from the centre, what is the distance of the other chord from the centre?

T – 2 min
S – Circle

Ans.

87. Construct a triangle PQR in which $QR = 6$ m, $\angle Q = 60°$ and $PR - PQ = 2$ cm

T	– 2 min
S	– Construction

Ans.

88. The circumference of the base of a right circular cylinder is 176 cm, find the curved surface area of the cylinder.

T	– 2 min
S	– Corved surface area

Ans.

Questions 89-90, Curved surface area of a cone is 264 cm^2 and its slant height is 12 cm

89. Find radius of the base.

T	– 4 min
S	– Corved surface area

Ans.

90. Find total surface area.

Ans.

Questions 91-92, Find the surface area of a sphere with :

91. Diameter 21 cm.

T – 2 min
S – Sphere

Ans.

92. Radius 14 cm

T – 2 min
S – Area

Ans.

Questions 93-94, A cubical box has each edge 10 cm and another cuboidal box is 12.5 cm long, 10 cm wide and 8 cm high.

93. Which box a greater lateral surface area and by how much?

T	– 2 min
S	– Cube

Ans.

94. Which box has the smaller total surface area and by how much?

T	– 2 min
S	– Surface area

Ans.

95. The thickness of a metallic tube is 1 cm and its outer radius is 11 cm. Find the mass of such a 1 meter long tube, if the density of the metal is 7.5 g per cm^3.

T	– 2 min
S	– Volume of cylinder

Ans.

96. A metallic solid cone is melted and cast in to the form of a circular cylinder of the same base as that of the cone. If the height of the cylinder is 7 cm, what was the height of the cone?

T	– 2 min
S	– Cylinder

Ans.

97. A semi-spherical bowl has inner diameter 11.2 cm. Find the volume of milk it can hold?

T – 3 min
S – Semi-spherical

Ans.

Questions 98-99, find the volume of the water that a spherical solid ball of following diameter will replace.

98. 35 dm

T – 3 min
S – Volume

Ans.

99. 2.8 m

T – 3 min
S – Volume

Ans.

100. A cylindrical vessel open at the top has a base diameter 21 cm and height 14 cm. Find the cost of tin-plating its inner part at the rate of Rs 5 per 100 cm.

T	– 3 min
S	– Volume

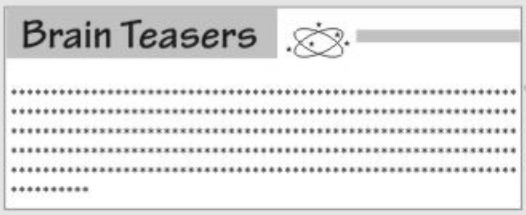
Ans.

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