Grade 09
Unit 09

Maths

Course Outline

Formative 3

- Linear equation
- Quadratic equation
- Area of Parallelogram
- Circles
- Constructions
- Surface area and volumes

MAT
(Monthly Achievement Tests)

Short Code: 447310

Test ID: NMM09U090

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.

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. Kite can be identified as

T – 1 min
S – Quadrilaterals

(a) pair of opposite sides are equal
(b) all the angles are equal
(c) adjacent sides are equal
(d) diagonals bisect each other

Ans.

2. Rhombus is a parallelogram with

T – 1 min
S – Quadrilaterals

(a) each angle 90°
(b) adjacent sides are equal
(c) diagonals bisect each other at 90°
(d) none of the above

Ans.

3. It is a collection of all points in a plane, which are equidistant from a fixed point in the plane

T – 1 min
S – Circle

(a) sphere (b) cube
(c) circle (d) cuboid

Ans.

4. Equal chords of a circle subtend _____ at the centre.

T – 1 min
S – Circle

(a) equal sides
(b) equal arc
(c) equal angles
(d) equal segments

Ans.

5. Parallelograms on the same base & between the same parallels are equals in
(a) Volumes (b) curved area
(c) Area (d) Length

T – 1 min
S – Area of parallelogram

Ans.

6. Rectangle and parallelogram on the same base & between same parallels are
(a) Congruent (b) Similar
(c) Equal in lengths (d) Equal in area

T – 1 min
S – Area of parallelogram

Ans.

7. 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.

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

T – 1 min
S – Quadrilateral

Ans.

9. If the sum of pair of opposite angles of a quadrilateral is 180°, the quadrilateral is
(a) kite (b) rhombus
(c) trapezium (d) cyclic

T – 1 min
S – Quadrilateral

Ans.

10. Find two solutions of $x + y = 4$.
(a) (0, 4) (0, 4) (b) (0, 4) (4, 0)
(c) (4, 0) (4, 0) (d) (4, 4)

T – 1 min
S – Linear equations

Ans.

11. $y = x + 2$ has
(a) one solution (b) two solution
(c) infinite many solution (d) none of these

T – 1 min
S – Linear equations

Ans.

12. Properties of rectangle does not include
(a) diagonals bisect each other at 90°
(b) each angle is 90°
(c) pair of opposite sides are equal
(d) diagonal divides it into two congruence

T – 1 min
S – Quadrilateral

Ans.

13. Perimeter of a square is ..... that of an equivalent parallelogram on the same base

(a) less than (b) greater than

(c) equal to (d) cannot be determined

T – 1 min
S – Quadrilateral

Ans.

14. Parallelograms on the same base & between the same parallels are equals in

(a) volumes (b) perimeter

(c) area (d) length

T – 1 min
S – Parallelogram

Ans.

15. Rectangles on the same base & between same parallels are

(a) congruent (b) similar

(c) equal in length (d) equal in area

T – 1 min
S – Parallelogram

Ans.

16. 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 – Parallelogram

Ans.

17. If the sum of pair of opposite angles of a quadrilateral is 180°, the quadrilateral is

(a) kite (b) rhombus

(c) trapezium (d) cyclic

T – 1 min
S – Parallelogram

Ans.

18. Out of these properties which property does not hold true in case of a parallelogram?

(a) opposite sides are equal

(b) opposite angles are equal

(c) diagonals bisect each other

(d) each angle is 90°

T – 1 min
S – Parallelogram

Ans.

19. If the angles of a quadrilateral are in the ratio of 1 : 4 : 5 : 6 then the angles are :

(a) 20.50°, 90°, 135°, 110.50°

(b) 22.50°, 90°, 112.50°, 135°

(c) 90°, 22.50°, 135°, 110.50°

(d) 22.50°, 90°, 135°, 112.50°

T – 1 min
S – Parallelogram

Ans.

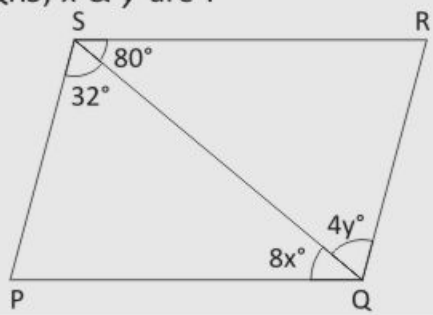
20. In the parallelogram *PQRS*, *x* & *y* are :

(a) 8° and 10°

(b) 6° and 4°

(c) 4° and 6°

(d) 10° and 8°



T – 1 min
S – Parallelogram

Ans.

Fill in the blanks

21. The magnitude or the measure of the plane is known as _____.

T – 1 min
S – Quadrilateral

Ans.

22. Perimeter of a square is_____ that of an equivalent parallelogram on the same base.

T – 1 min
S – Parallelogram

Ans.

23. Triangles on the same base & between the same parallels are _____ .

T – 1 min
S – Area of triangle

Ans.

24. Area of rhombus _____.

T – 1 min
S – Area of Parallelogram

Ans.

25. An equation of the type $y = mx$ represents a line passing throughly _____ .

T – 1 min
S – Linear equation

Ans.

26. A linear equation in two variables has _____ solutions.

T – 1 min
S – Linear equation

Ans.

27. Parallelogram and rectangle have the same base and also have equal areas, then the perimeter of the parallelogram is _____ than that of the rectangle.

T – 1 min
S – Parallelogram

Ans.

28. *ABCD* is a quadrilateral with $AD = BC$ & $\angle DAB = \angle CBA$, then ΔABD and ΔBAC are congruent by _____ congruence criterion.

T – 1 min
S – Parallelogram

Ans.

29. The bisector of angles of parallelogram form a _____ .

T – 1 min
S – Parallelogram

Ans.

30. If the diagonals of a quadrilateral bisect each other at right angles, then it is a _____ .

T – 1 min
S – Parallelogram

Ans.

True or False

31. Two congruent figures have equal area.

T – 1 min
S – Area

Ans.

32. If the square and a Rhombus stand on the same base then the square has the smaller area.

T – 1 min
S – Area of parallelogram

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. Parallelograms on the same base and between the same parallels are not equal in area.

T – 1 min
S – Parallelogram

Ans.

36. Every parallelogram is a rhombus.

T – 1 min
S – Rectilinear figures

Ans.

37. A figure formed by joining four points in an order is called a parallelogram.

T – 1 min
S – Rectilinear figures

Ans.

38. Two figures are called congruent, if they have the same shape and the same size.

T – 1 min
S – Parallelogram

Ans.

39. Diagonals of a parallelogram divide it into four triangles of equal area.

T – 1 min
S – Rectilinear figures

Ans.

40. Every rectangle is a square.

T – 1 min
S – Rectilinear figures

Ans.

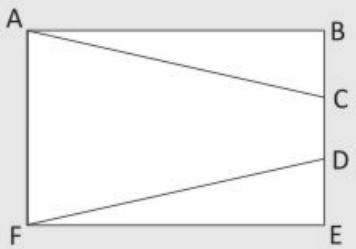
Simple Questions

41. Prove that if the diagonals of a quadrilateral bisect each other, then it is a parallelogram.

T	– 1 min
S	– Quadrilateral

Ans.

42. write the common base and the two parallels.



T	– 1 min
S	– Area of parallelograms and triangles

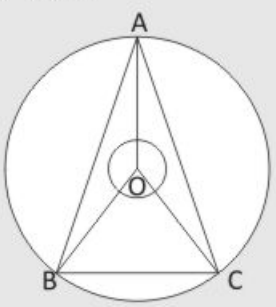
Ans.

43. Show that parallelograms on the same base and between the same parallels are equal in area.

T	– 1 min
S	– Area of parallelograms and triangles

Ans.

44. An equilateral triangle *ABC* is inscribed in a circle with centre *O* as shown in the figure. Find $\angle BOC$, $\angle COA$ and $\angle AOB$.

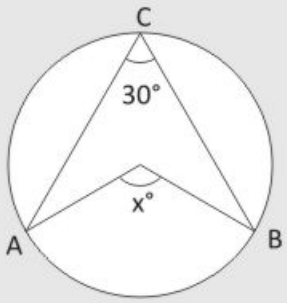


T	– 1 min
S	– Circle

Ans.

45. Find the value of x.

T	– 1 min
S	– Circle



Ans.

46. Find the value of x when $y = 3$ in the equation $4x + 5y - 30 = 0$

T	– 1 min
S	– Linear equation

Ans.

47. Find the value of a in the equation $y + 2x = a$ if $y = -3$ and $x = 5$.

T	– 1 min
S	– Linear equation

Ans.

48. Find the value of y, when $x = 2$ in the equation $13x - 12y = 25$.

T	– 1 min
S	– Linear equation

Ans.

49. *ABCD* is a parallelogram. Compute the values of *x* and y.

T	– 1 min
S	– Parallelogram

Ans.

50. In a parallelogram *ABCD*, $AB = 10$ cm. The altitudes corresponding to the sides *AB* and *AD* are 7 cm and 8 cm respectively. Find *AD*.

T	– 1 min
S	– Parallelogram

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. If a pair of a consecutive sides are equal then the rectangle is

T – 1 min
S – Quadrilaterals

Ans.

52. If one angle of a parallelogram is 90° then it is a

T – 1 min
S – Quadrilaterals

Ans.

Questions 53-55, using the given statement. Give the answer of the following:
If O is any point in the interior of parallelogram ABCD. Then

53. area (*AOB*) + area (*ODC*)

(a) area (*ABCD*)

(b) $\frac{1}{3}$ area (*ABCD*)

(c) $\frac{1}{2}$ area (*ABCD*)

(d) cannot be determined

T – 1 min
S – Area of parallelogram

Ans.

54. area (AOB) + area OCB =

(a) area $(ABCD)$

(b) $\frac{1}{4}$ area $(ABCD)$

(c) $\frac{1}{2}$ area $(ABCD)$

(d) cannot be determined

T – 1 min
S – Area of parallelogram

Ans.

55. area (AOD) + area (OBC)

(a) $\frac{1}{2}$ area $(ABCD)$

(b) $\frac{1}{4}$ area $(ABCD)$

(c) area $(ABCD)$

(d) None of these

T – 1 min
S – Area of parallelogram

Ans.

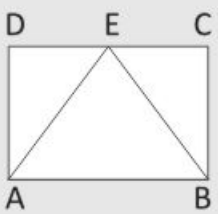
56. If $PQRS$ are the mid points of the sides of a parallelogram $ABCD$, then area $(PQRS)$ will be

T – 2 min
S – Area of parallelogram

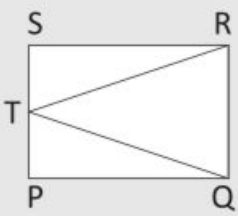
Ans.

57. Which of the given figures are not on the same base & between the same parallels.

(a)

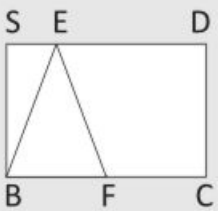


(b)

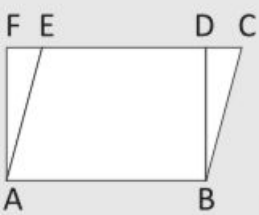


T – 1 min
S – Area of parallelogram

(c)



(d)



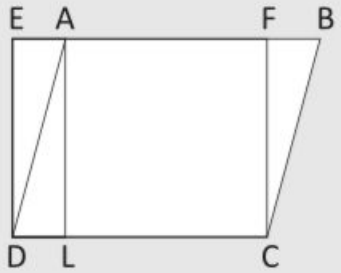
Ans.

58. *ABCD* is parallelogram and *EFCD* is a rectangle. Also $AL \perp DC$. Prove that

(i) $ar\ (ABCD) = ar\ (EFCD)$

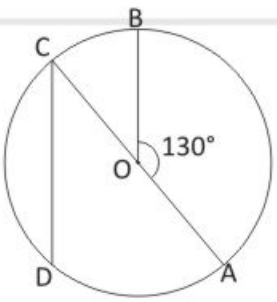
(ii) $ar\ (ABCD) = DC \times AL$

T	– 2 min
S	– Area of parallelogram



Ans.

Questions 59-60, In the adjoining figure, AC is the diameter of the circle with centre O. If $\angle AOB = 130°$.



59. Find $\angle BOC$.

T	– 4 min
S	– Circle

Ans.

60. Find $\angle BDC$

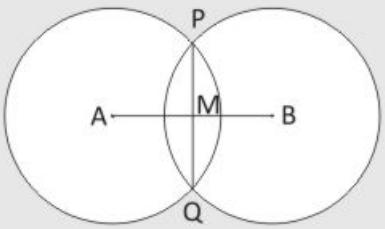
Ans.

61. Two circles with centres A and B intersect each other at P and Q and M is the mid point of PQ as shown in the given figure. Give reasons for the following statements :

(i) $AM \perp PQ$ (ii) $BM \perp PQ$

(iii) A, M and B are collinear

T – 2 min
S – Circle



Ans.

62. Find the radius of a circle, if its area is equal to the area of a square of 4 cm side.

T – 2 min
S – Circle

Ans.

63. Show that the diagonals of a square are perpendicular to each other

T – 2 min
S – Quadrilateral

Ans.

64. Show that in a right angled triangle the hypotenur in the longest side.

T – 2 min
S – Triangles

Ans.

Questions 65-68, Express the following linear equations in the form of $ax + by = c$ and indicate the values of a, b and c in each case.

65. $3x + 3y + 9.3\overline{25} = 0$

T – 4 min
S – Linear equation

Ans.

66. $x = 2y$

Ans.

67. $4 = 3x$

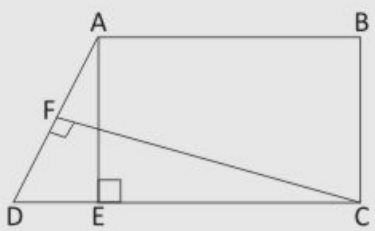
Ans.

68. $y - 2 = 0$

Ans.

69. In figure, $ABCD$ is a parallelogram and AE $\perp$ DC and CF $\perp$ AD, if $AB = 16$ cm, $AE = 8$ cm and $CF = 10$cm find AD ?

T – 2 min
S – Parallelogram



Ans.

70. If circles are drawn taking two sides of a triangle as diameter, prove that point of intersection of these circles lie on the third side.

T	– 1 min
S	– Circle

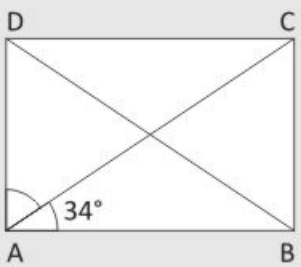
Ans.

71. If one angle of a parallelogram is 90° then it is a _____.

T	– 1 min
S	– Parallelogram

Ans.

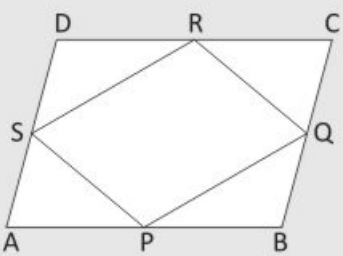
72. *ABCD* is a rectangle with $\angle CAB = 34°$ then find the $\angle DAC = ?$



T	– 1 min
S	– Parallelogram

Ans.

73. If *PQRS* are the mid points of the sides of a parallelogram *ABCD*, then area of the *PQRS*.



T	– 1 min
S	– Parallelogram

Ans.

74. Show that the diagonals of a parallelogram divide it in four triangles of equal area.

T	– 2 min
S	– Parallelogram

Ans.

Match the following:

T	– 5 min
S	– Area

75.	$\frac{1}{2}$ × sum of parallel sides × height	(i) area of triangle
76.	Length × breadth	(ii) area of parallelogram
77.	$\frac{1}{2}$ × base × height	(iii) area of rhombus
78.	$\frac{1}{2}$ × product of diagonals	(iv) area of rectangle
79.	$\frac{1}{2}$ × base × altitude	(v) area of trapezium

Ans.

80. In a quadrilateral $ACBD$, $AC = AD$ and AB bisects $\angle A$. Show that $\Delta ABC \cong \Delta ABD$ and $BC = BD$.

T	– 2 min
S	– Parallelogram

Ans.

20

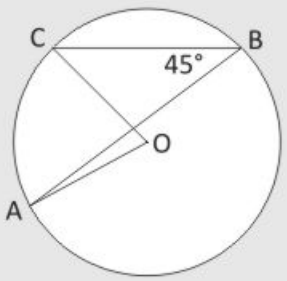
Opening Window

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. In the adjoining figure, O is the centre of circle and $\angle ABC = 45°$.
(i) Find $\angle AOC$. (ii) Is $OA \perp OC$ why?

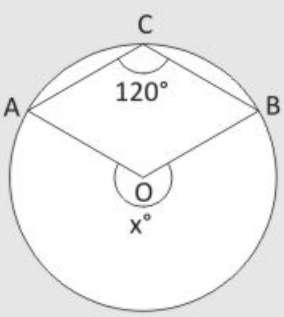
T	– 2 min
S	– Circle



Ans.

82. From the given figure, find the value of x.

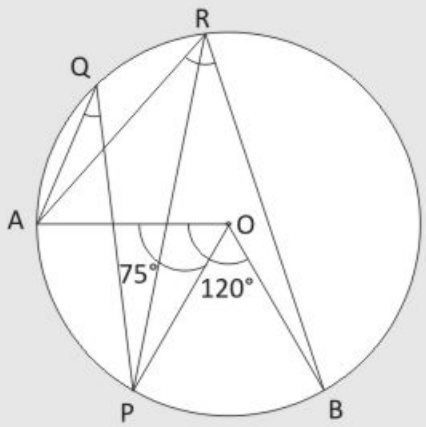
T	– 2 min
S	– Circle



Ans.

83. P is a point on the minor arc AB a circle with centre O as shown in given figure. If $\angle AOB = 120°$ and $\angle AOP = 75°$. Find
(i) $\angle ARB$ (ii) $\angle AQP$ (iii) $\angle ARP$ (iv) $\angle BRP$

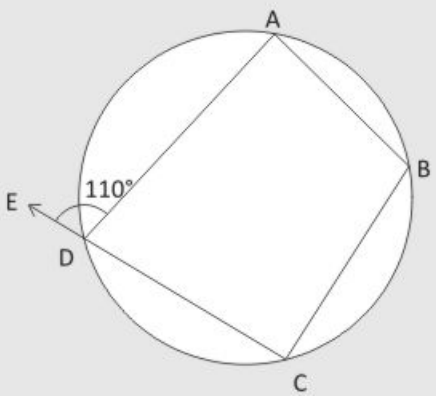
T	– 2 min
S	– Circle



Ans.

84. In the adjoining figure, $\angle ADE = 110°$.
Find (i) $\angle ADC$, (ii) $\angle ABC$

T	– 2 min
S	– Circle



Ans.

Questions 85-86, Write the equation in the form of $ax^2 + bx + c = 0$ and find the indicated value

85. Value of *a* and *b* in $0.048 = 0.467x^2 - 7\sqrt{3}x$

T	– 4 min
S	– Linear equation

Ans.

86. Value of *a* and *c* in $-7x^2 + 4\sqrt{3}x = -0.879$

Ans.

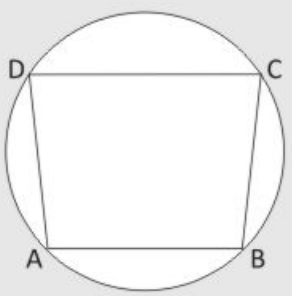
87. *ABCD* is a cyclic trapezium with $AB \| DC$ as shown in the adjoining figure. Give reasons for the following statements

T	– 2 min
S	– Linear equation

(i) $\angle A + \angle D = 180$

(ii) $\angle B + \angle D = 180^\circ$

(iii) $\angle A = \angle B$



Ans.

88. The mean of 6 numbers is 20. If one number is excluded, then the mean is 15. Find the value of excluded number will be?

T	– 2 min
S	– Linear equation

Ans.

89. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement

T	– 2 min
S	– Linear equation

Ans.

90. Write four solutions for the following equation $2x + y = 5$.

T	– 2 min
S	– Linear equation

Ans.

91. Show that a diagonal of a parallelogram divides it into two congruent triangles.

T	– 2 min
S	– Quadrilateral

Ans.

92. The angles of quadrilateral are in the ratio 3 : 5 : 9 : : 3. Find all the angles of the quadrilateral.

T	– 2 min
S	– Angles of quadrilateral

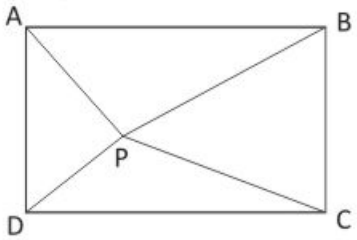
Ans.

93. Find the value of x, when $y = 5$ in the equation $4x + 3y - 7 = 0$.

T	– 2 min
S	– Linear equation

Ans.

Questions 94-95, In the figure, P is a point in the interior of a parallelogram ABCD.



94. Show that $ar\,(\Delta APB) + ar(\Delta PCD) = \frac{1}{2}\,ar$ (parallelogram).

T	– 4 min
S	– Area of Parallelogram

Ans.

95. Show that $ar\,(\Delta APD) + ar\,(\Delta PBC) = ar\,(\Delta APB) + ar(\Delta PCD)$.

Ans.

96. Find the properties of parallelogram, when

T	– 3 min
S	– Parallelogram

(i) The opposite angles are equal.

(ii) The opposite sides are parallel and equal.

(iii) The diagonals bisects each other.

(iv) Each diagonal divide a parallelogram in two congruent triangles.

Ans.

97. *ABCD* is a trapezium on which $AB \| DC$, *BD* is a diagonal and *E* is the mid-point of *AD*. A line is drawn through *E* parallel to *AB* intersecting *BC* at *F*. Show that *F* is the mid-point of *BC*.

T	– 3 min
S	– Properties of Parallelogram

Ans.

98. If a triangle and a parallelogram are on the same base and between the same parallels, then prove that the area of the triangle is equal to half the area of the parallelogram.

T	– 3 min
S	– Parallelogram

Ans.

99. In the given figure, *ABCD* is a quadrilateral and *BE*||*AC* and also *BE* meets *DC* produced at *E*. Show that area of ΔADE is equal to the area of the quadrilateral *ABCD*.

T	– 3 min
S	– Parallelogram

Ans.

100. The ratio of the number of sides of two regular Polygons is 3:4, and the ratio of the sum of their interior angles is 2:3. Find the number of sides of each Polygon.

T	– 3 min
S	– Rectilinear figures

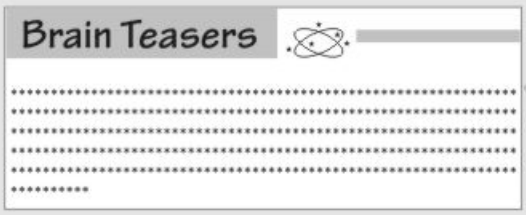
Ans.

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