Grade 10
Unit 02

Maths

Course Outline

- Pair of Linear Equations in two Variables
- Triangle

MAT
(Monthly Achievement Tests)

Short Code: 447311

Test ID: NMM10U020

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.

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 system of two linear equations in x and y has no solution if the two graph lines are

(a) parallel (b) perpendicular

(c) concurrent (d) linear

T – 1 min
S – Linear equation

Ans.

2. Find the value of k from the following $8x + 5y = 0, kx + 10y = 0$.

(a) 16 (b) 15

(c) 6 (d) 12

T – 1 min
S – Linear equation

Ans.

3. Solve for x and y: $11x + 15y + 23 = 0$ and $7x - 2y - 20 = 0$

(a) $(-2, -3)$ (b) $(-2, 3)$

(c) $(2, -3)$ (d) $(2, 3)$

T – 1 min
S – Linear equation

Ans.

4. Find the value of m for which $y = mx + 3$ when $x = -2$ and $y = 5$.

(a) -2 (b) -3

(c) -1 (d) 1

T – 1 min
S – Linear equation

Ans.

5. Solve for x and y, $x - y = 0$ and $2x - y = 2$.

(a) $x = 2, y = 2$ (b) $x = -2, y = -2$

(c) $x = -2, y = 2$ (d) $x = 2, y = -2$

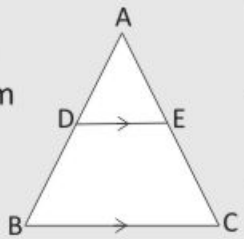
T – 1 min
S – Linear equation

Ans.

6. In the given figure, in ΔABC $DE \| BC$, so that $AD = 2.4$ cm, $AE = 3.2$ cm and $EC = 4.8$ cm. Then $AB =$

(a) 3.6 cm (b) 6 cm

(c) 6.4 cm (d) 1.6 cm



T – 1 min
S – Triangle

Ans.

7. $\Delta ABC \sim \Delta DEF$ and perimeters of ΔABC and ΔDEF are 30 cm and 18 cm respectively. If $BC = 9$ cm, then $EF =$

(a) 6.3 cm (b) 5.4 cm

(c) 7.2 cm (d) 4.5 cm

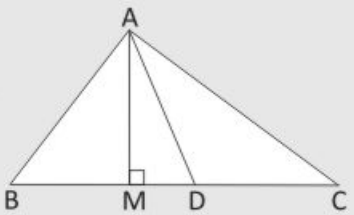
T – 1 min
S – Triangle

Ans.

8. I n ΔABC, AD is the bisector of $\angle A$. Then $\frac{\text{area}(\Delta ABD)}{\text{area}(\Delta ACD)} =$

(a) $\frac{AB^2}{AC^2}$ (b) $\frac{AB}{AC}$

(c) $\frac{BM}{CM}$ (d) none of these



T – 1 min
S – Triangle

Ans.

9. Solve for x and y, $x - y = 6$ and $x - 2y = 3$.

(a) $x = 9, y = 3$ (b) $x = -3, y = -9$

(c) $x = -9, y = 3$ (d) $x = 9, y = -3$

T – 1 min
S – Linear equation

Ans.

10. In the given ΔABC, AD is the internal bisector of $\angle A$. If $BD = 4$ cm, $DC = 5$ cm and $AB = 6$ cm, then $AC =$

(a) 3 cm (b) 8 cm

(c) 4.5 cm (d) 7.5 cm

T – 1 min
S – Triangle

Ans.

11. Solve for x and y, $4x - 3y = 8$, and $6x - y = \frac{29}{3}$.

T – 1 min
S – Linear equation

(a) (3/2, −2/3) (b) (−3/2 −2/3)
(c) (2/3, 3/2) (d) (−3/2, 2/3)

Ans.

12. In the given figure, in ΔABC, AD is the internal bisector of $\angle A$ such that $AB = 10$ cm, $AC = 14$ cm, and $BC = 6$ cm, then $CD =$ is equal to

(a) 2.5 cm (b) 3.5 cm
(c) 4.8 cm (d) 7 cm

T – 1 min
S – Triangle

Ans.

13. Find x and y. If $2x + 5y = 1$, and $2x + 3y = 3$.

(a) (−3, 1) (b) (3, 1)
(c) (3, −1) (d) (2, 3)

T – 1 min
S – Linear equation

Ans.

14. Find the height of an equilateral triangle of side 12 cm.

(a) $6\sqrt{2}$ units (b) $6\sqrt{3}$ units
(c) $6\sqrt{5}$ units (d) 6 units

T – 1 min
S – Triangle

Ans.

15. The sum of the numerator and the denominator of fraction is 12. If the denominator is increased by 3, the fraction becomes 1/2. Find the fraction.

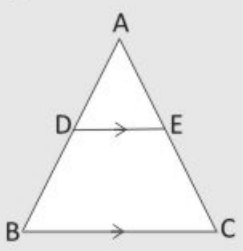
(a) 7/5 (b) 5/7
(c) 2/7 (d) 3/7

T – 1 min
S – Linear equation

Ans.

16. In the given ΔABC, $DE \,||\, BC$ and $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 5.6$ cm, then $AE$is equal to

(a) 4.2 cm
(b) 3.1 cm
(c) 2.1 cm
(d) 2.8 cm



T – 1 min
S – Triangle

Ans.

17. In $\Delta ABC, \frac{AB}{AC} = \frac{BD}{DC}, \angle B = 70°$ and $\angle C = 50°$ then $\angle BAD =$ is equal to

(a) 30° (b) 40°

(c) 50° (d) 45°

T – 1 min
S – Triangle

Ans.

18. If the bisector of an angle of a triangle bisects the opposite side, then the triangle is

(a) scalene (b) equilateral

(c) isosceles (d) right angled

T – 1 min
S – Triangle

Ans.

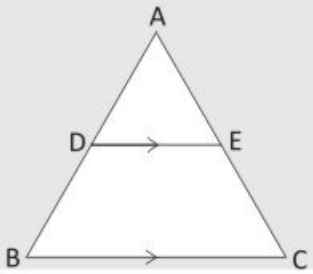
19. In the given $\Delta ABC, DE \| BC$, so that $AD = 1.2$ cm, $AE = 1.8$ cm and $EC = 4.8$ cm. Find AB.

(a) 3.6 cm

(b) 6 cm

(c) 6.4 cm

(d) none of the above



T – 1 min
S – Triangle

Ans.

20. $\Delta ABC \sim \Delta DEF$ such that $AB = 9.1$ cm and $DE = 6.5$ cm. If the perimeter of ΔDEF is 25 cm, then what is the perimeter of ΔABC?

(a) 35 cm (b) 28 cm

(c) 42 cm (d) 40 cm

T – 1 min
S – Triangle

Ans.

Fill in the blanks

21. Linear equation in two variables has _____ solutions.

T – 1 min
S – Linear equation

Ans.

22. $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$, the pair of linear equations is _____.

T – 1 min
S – Linear equation

Ans.

23. A system of two linear equation in two unknowns is said to be consistent if it has at least _____ .

T – 1 min
S – Linear equation

Ans.

24. Linear equation has _____ solutions.

T – 1 min
S – Linear equation

Ans.

25. Two triangles are said to be equiangular if the corresponding angles are _____ .

T – 1 min
S – Triangle

Ans.

26. $ax + by + c = 0$ is called a linear equation in _____ .

T – 1 min
S – Linear equation

Ans.

27. A system of two linear equations in two unknowns is said is be in consistent if has at least _____ .

T – 1 min
S – Linear equation

Ans.

28. Two geometric figures which have the same shape and size are known as _____ .

T – 1 min
S – Linear equation

Ans.

29. In a right triangle, the square of the _____ is equal to the sum of the squares of the other two sides.

T – 1 min
S – Triangle

Ans.

30. If the bisector of an angle of a triangle bisects the opposite side, then the triangle is _____ .

T – 1 min
S – Triangle

Ans.

True or False

31. Substitution method is used to solve the quadratic equations.

T	– 1 min
S	– Linear equation

Ans.

32. $a_1b_2 - a_2b_1 \neq 0$, then the pair of linear equation has a unique solution.

T	– 1 min
S	– Linear equation

Ans.

33. A pair of linear equations in two variables can be represented and solved by the graphical method and algebraic method.

T	– 1 min
S	– Linear equation

Ans.

34. If the lines are parallel, then the pair of equation has no solution.

T	– 1 min
S	– Linear equation

Ans.

35. $ax + b$ is called the standard form of a quadratic equation.

T	– 1 min
S	– Linear equation

Ans.

36. Since $(4, 2)$ is the only common point on both the lines there is one and only are solution for this pair of linear equation in two variables.

T	– 1 min
S	– Linear equation

Ans.

37. A pair of linear equations which has no solution is called consistent pair of linear equation.

T	– 1 min
S	– Linear equation

Ans.

38. Two figures having the same shape are called similar figures.

T	– 1 min
S	– Triangle

Ans.

39. Two polygons of the same number of side are similar.

T	– 1 min
S	– Triangle

Ans.

40. The triangles are said to be equiangular if their corresponding angles are equal

T	– 1 min
S	– Triangle

Ans.

Simple Question

41. Solve for x and y, $0 \cdot 4x - 1 \cdot 5y = 6 \cdot 5, 0 \cdot 3x + 0 \cdot 2y = 0 \cdot 9$.

T	– 1 min
S	– Linear equation

Ans.

42. Solve $4x - 7y + 28 = 0, 5y - 7x + 9 = 0$.

T	– 1 min
S	– Linear equation

Ans.

43. A two digit number is 4 more than 6 times the sum of its digits, if 18 is subtracted from the number, the digits are reversed. Find the number.

T	– 1 min
S	– Linear equation

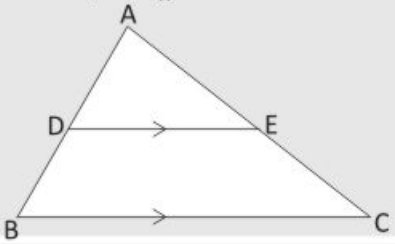
Ans.

44. The sum of the numerator and the denominator of fraction 12. If the denominator is increased by 3, the fraction becomes 1/2. Find the fraction.

T	– 1 min
S	– Linear equation

Ans.

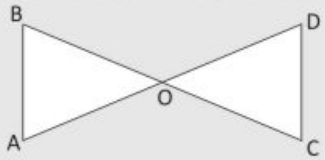
45. In the given figure, in ΔABC, $DE \parallel BC$ so that $AD = 2.4$ cm, $AE = 3.2$ cm and $BD = 3.6$ cm, find AC



T – 1 min
S – Triangle

Ans.

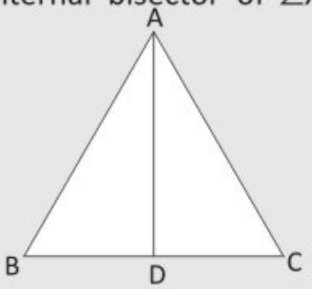
46. In the given figure, $\Delta AOB \sim \Delta DOC$. Prove that $AB \parallel CD$.



T – 1 min
S – Triangle

Ans.

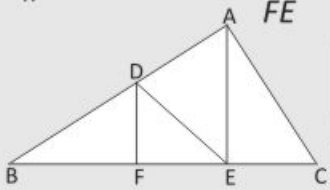
47. In ΔABC, AD is the internal bisector of $\angle A$. If $BD = 5$ cm, $BC = 7.5$ cm then find $AB : AC$.



T – 1 min
S – Triangle

Ans.

48. In the given figure, $DE \parallel AC$ and $DF \parallel AE$. Prove that $\frac{BF}{FE} = \frac{BE}{EC}$.



T – 1 min
S – Triangle

Ans.

Q. 49 - 50. Solve each of the following

49. $x + y = 3$
$2x + 5y = 12$

T – 1 min
S – Linear equation

Ans.

50. $x + 2y + 2 = 0$
$3x + 2y - 2 = 0$

T – 1 min
S – Linear equation

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. Solve the following using substitution method.

51. $2x + y = 7, 4x - 3y + 1 = 0$

T – 1 min
S – Linear equation

Ans.

52. $x + y = 8, 2x - 3y = 1$

T – 1 min
S – Linear equation

Ans.

Q 53 - 55 Solve each of the following systems of equations by method of cross-multiplication.

53. $2x + y = 35$
$3x + 4y = 65$

T – 1 min
S – Linear equation

Ans.

54. $\frac{x}{6} + \frac{y}{15} = 4$
$\frac{x}{3} - \frac{y}{12} = \frac{19}{4}$

T – 1 min
S – Linear equation

Ans.

55. $ax + by = a - b$
$bx - ay = a + b$

T – 1 min
S – Linear equation

Ans.

Q. 56 - 58 Solve each of the following systems of equation by elimination method.

56. Solve for x and y, if $ax + by - a + b = 0, bx - ay - a - b = 0$.

T – 1 min
S – Linear equation

Ans.

57. Solve for x and y, if $x - y = 3$
$3x - 2y = 10$

T – 1 min
S – Linear equation

Ans.

58. Solve for x and y, if $\frac{ax}{b} - \frac{by}{a} = a + b$
$ax - by = 2ab$

T – 2 min
S – Linear equation

Ans.

Q. 59 - 60 Solve each of the following system of equation by substitution method

59. $x + 3y = 0$
$3x + 4y = 5$

T – 1 min
S – Linear equation

Ans.

60. $2x = 3$
$5x = 2y + 7$

T	– 1 min
S	– Linear equation

Ans.

61. Solve graphically the system of linear equations $x + 2y = 3, 4x + 3y = 2$

T	– 2 min
S	– Linear equation

Ans.

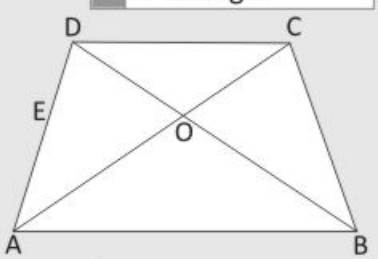
62. Prove that the line segment joining the midpoints of any two sides of a triangle is parallel to the third side.

T	– 1 min
S	– Triangle

Ans.

63. *ABCD* is a trapezium in which $AB \| DC$ and its diagonals intersect each other at the point *O*. Prove that $\frac{AO}{OC} = \frac{BO}{OD}$.

T	– 2 min
S	– Triangle



Ans.

64. If the bisector of an angle of a triangle bisects the opposite side, prove that the triangle is isosceles.

T	– 1 min
S	– Triangle

Ans.

65. In $\Delta ABC, AD$ is a median and E is the midpoint of AD. If BE is produced, it meets AC in F shows that $AF = \frac{1}{3}AC$.

T	– 1 min
S	– Triangle

Ans.

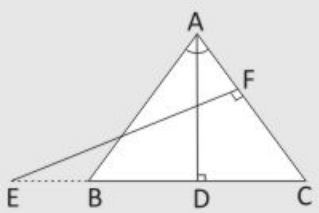
66. In the given figure, AD is the bisector of $\angle BAC$. If $AB = 10$ cm, $AC = 6$ cm and $BC = 12$ cm, find BD and DC.

T	– 2 min
S	– Triangle

Ans.

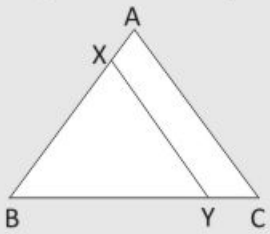
67. In the given figure, E is a point on side CB produced of an isosceles ΔABC with $AB = AC$.
If $AD \perp BC$ and $EF \perp AC$, prove that $\Delta ABD \sim \Delta BCF$.

T	– 2 min
S	– Triangle



Ans.

68. In the given figure, the line segments XY is parallel to side AC of ΔABC and if divides the triangles into two parts of equal area prove that $AX : AB = (2 - \sqrt{2}) : 2$

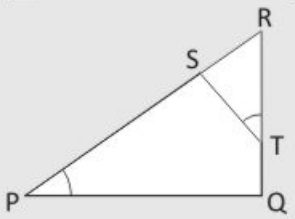


T	– 2 min
S	– Triangle

Ans.

69. In the given figure, S and T are points on sides PR and QR of ΔPQR such that $\angle P = \angle RTS$, show that $\Delta RPQ \sim \Delta RTS$.

T	– 2 min
S	– Triangle



Ans.

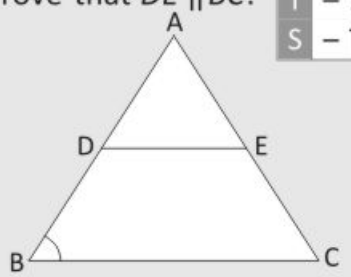
70. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, find the corresponding side of the second triangle.

T	– 2 min
S	– Triangle

Ans.

71. In the ΔABC, $\angle B = \angle C$ and $BD = CE$. Prove that $DE \parallel BC$.

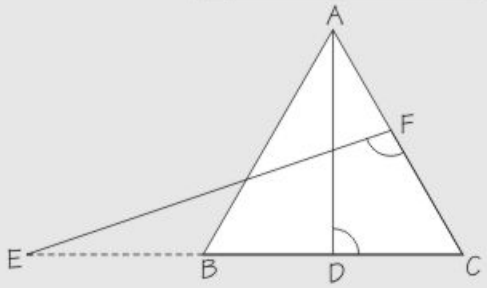
T	– 1 min
S	– Triangle



Ans.

72. In the given figure, E is a point on side produced of an isoceles ΔABC with $AB = AC$. If $AD \perp BC$ and $EF \perp AC$, prove that $\Delta ABD \sim \Delta ECF$.

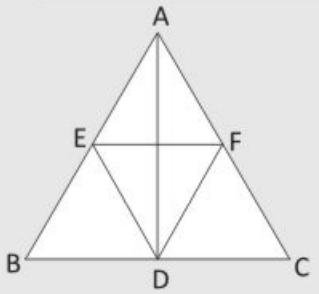
T	– 2 min
S	– Triangle



Ans.

73. In the given figure, AD is a median of ΔABC. The bisectors of $\angle ADB$ and $\angle ADC$ meet AB and AC at E and F respectively. Prove that $EF \parallel BC$.

T	– 2 min
S	– Triangle



Ans.

74. The areas of two similar triangles ΔABC and ΔPQR are 25 cm^2 and 49 cm^2 respectively. If $QR = 9.8$ cm, Find BC.

T	– 2 min
S	– Triangle

Ans.

75–77. Solve the following using elimination method

75. $10x + 3y = 75,\ 6x - 5y = 11$

T – 2 min
S – Linear equation

Ans.

76. $(a-b)x + (a+b)y = a^2 - 2ab - b^2,\ (a+b)x + (a+b)y = a^2 + b^2$

T – 2 min
S – Linear equation

Ans.

77. $47x + 31y = 63, \qquad 31x + 47y = 15$

T – 2 min
S – Linear equation

Ans.

78. Find the value of α and β for which the following system of linear equations has infinitely many solutions.

$2x + 3y = 7$

$2\alpha x + (\alpha + \beta)\, y = 28$

T – 2 min
S – Linear equation

Ans.

79. For what values of k, the following pair of linear equations have no solution?

$(3k+1)x+3y-2=0$

$(k^2+1)x+(k-2)y-5=0$

T	– 2 min
S	– Linear equation

Ans.

80. Find the value of k for which the system of equations $x-2y=3, 3x+ky=1$ has a unique solution.

T	– 2 min
S	– Linear equation

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**

Thinking Ablility

81. Solve for x and y $10x + 3y = 75, 6x - 5y = 11$.

T – 2 min
S – Linear equation

Ans.

82. Solve for x and if y $\sqrt{2}x - \sqrt{3}y = 0, \sqrt{5}x + \sqrt{2}y = 0$.

T – 2 min
S – Linear equation

Ans.

83. Show graphically that the system of equations $3x - y = 2$ and $9x - 3y = 6$ has an infinite number of solutions.

T – 2 min
S – Linear equation

Ans.

Q 84 to 85. Solve the following systems of equation by using the method of cross multiplication.

84. $x + 2y + 1 = 0,\ 2x - 3y - 12 = 0$

T – 2 min
S – Linear equation

Ans.

85. $\frac{x}{a}+\frac{y}{b}=a+b, \frac{x}{a^2}+\frac{y}{b^2}=2$

T – 2 min
S – Linear equation

Ans.

86. The students of a class are made to stand in rows. If 4 students are extra in each row, there would be 2 rows less. If 4 students are less in each row, there would be 2 rows less. If 4 students are less in each row, there would be 4 rows more. Find the number of students in the class?

T – 2 min
S – Linear equation

Ans.

87. 8 men and 12 boys can finish a piece of work in 5 days, while 6 men and 8 boys can finish it in 7 days. Find the time taken by 1 man alone and that by 1 boy alone to finish the work.

T – 2 min
S – Linear equation

Ans.

88. Find the value or values of k for which the system of equations $kx-y=2$, $6x-2y=3$ has (i) unique solution (ii) no solution. Is there a value of k for which the given system has infinitely many solutions?

T – 2 min
S – Linear equation

Ans.

89. The sum of the numerator and the denominator of a fraction is 12. If the denominator is increased by 3, the fraction becomes $\frac{1}{2}$. Find the fraction.

T	– 2 min
S	– Linear equation

Ans.

90. Show that the system of equations $3x - 5y = 11, 6x - 10y = 7$ is inconsistent.

T	– 2 min
S	– Linear equation

Ans.

91. The sum of two numbers is 137 and their difference is 43. Find the numbers.

T	– 2 min
S	– Linear equation

Ans.

92. Abdul travelled 300 km by train and 200 km by taxi taking 5 hours 30 minutes. But if he travels 260 km by train and 240 km by taxi, he takes 6 minutes longer. Find the speed of the train and that of the taxi.

T	– 2 min
S	– Linear equation

Ans.

93. Two places *A* and *B* are 120 km apart from each other on a highway. A car starts from A and another from B at the same time. If they move in the same. direction, they meet in 6 hours, and if they move in opposite directions. They meel in 1 hours 12 minutes. Find the speed of the each car.

T – 2 min
S – Linear equation

Ans.

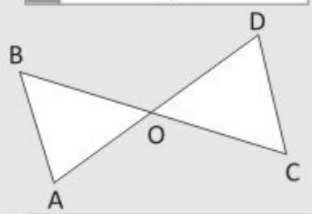
94. A two-digit number is such that the product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number.

T – 2 min
S – Linear equation

Ans.

95. In the given figure, $AB \| CD$. Prove that $\Delta AOB \sim \Delta DOC$.

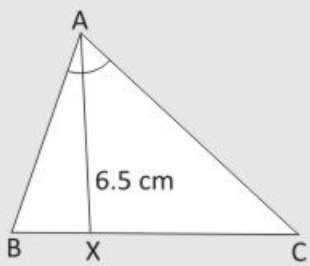
T – 2 min
S – Triangle

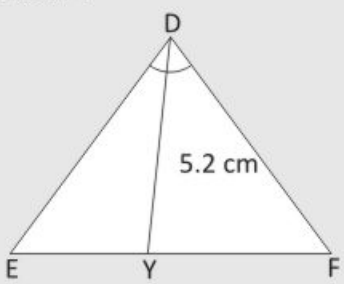


Ans.

96. In the figure given below, $\Delta ABC \sim \Delta DEF$ in which *AX* and *DY* are the bisectors of $\angle A$ and $\angle D$ respectively. If $AX = 6.5$ cm and $DY = 5.2$ cm. Find the ratio of the area of ΔABC and ΔDEF.

T – 3 min
S – Triangle

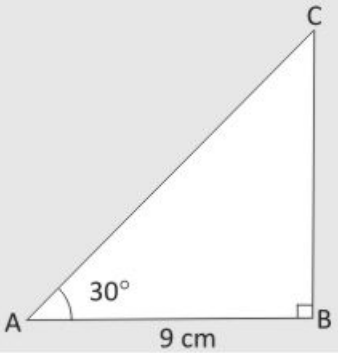




Ans.

97. In the adjoining figure, ΔABC is right angled at B. If $\angle A = 30^\circ$ and $AB = 9$ cm, find (i) BC and (ii) AC.

T – 3 min
S – Triangle



Ans.

98. D, E, F are respectively the midpoint of sides, BC, CA and AB of ΔABC. Find the ratio of the areas of ΔDEF and ΔABC.

T – 3 min
S – Triangle

Ans.

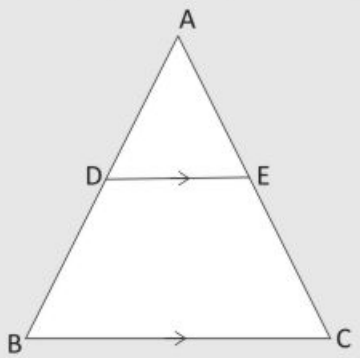
99. BL and CM are medians of a ΔABC, right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$.

T – 3 min
S – Triangle

Ans.

100. In the given figure, $DE \parallel BC$ and $AD : BD = 2 : 3$. Show that area (ΔADE) : area $(\Delta ABC) = 4 : 25$.

T – 3 min
S – Triangle



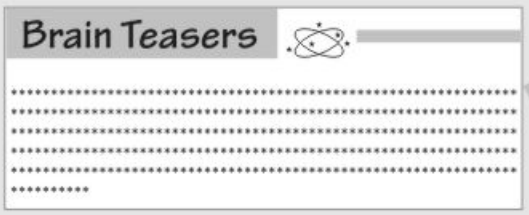
Ans.

Tools at a glance

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

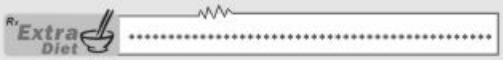
Let's Chat, the feature with suggestive topics for discussion so as to improve your capacity to debate on various topics.

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 (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