

Roll No.

Code : H8MA102

KENDRIYA VIDYALAYA SANGATHAN, PATNA REGION
PERIODIC TEST - 2, 2018-19
3648

CLASS - X
MATHEMATICS

Sl.No. _____

TIME - 3 HOURS]

[MAX. MARKS - 80

General Instructions :

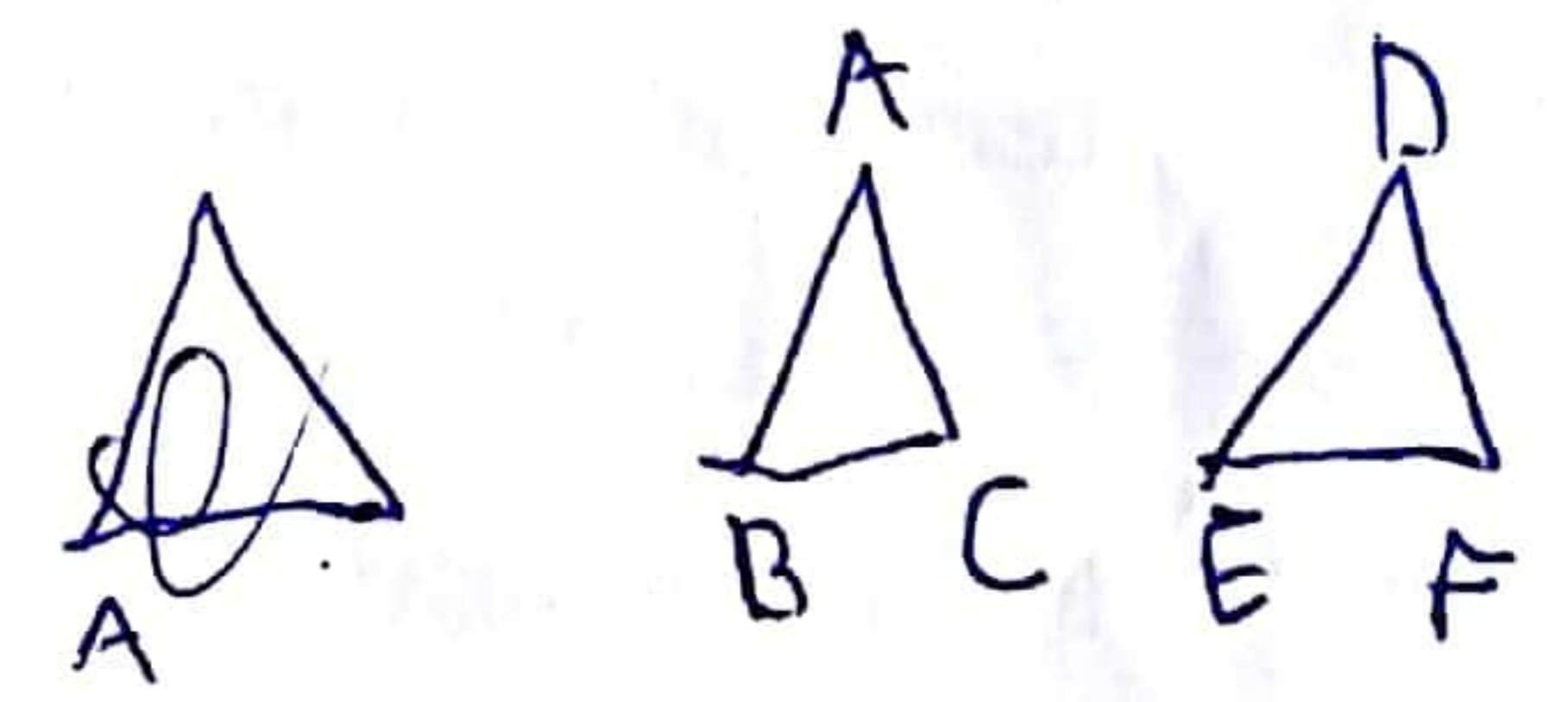
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- (i) All questions are compulsory.
- (ii) Question no. 1 to 6 in Section A are of 1 mark each.
- (iii) Question no. 7 to 12 in Section B are of 2 marks each.
- (iv) Question no. 13 to 22 in Section C are of 3 marks each.
- (v) Question no. 23 to 30 in Section D are of 4 marks each.

Handwritten calculation: $2 \overline{) 70} \begin{matrix} 35 \\ 70 \\ \hline 0 \end{matrix}$

SECTION - A

- 1. What is the largest number which divides 70 and 123, leaving remainders 5 and 8 respectively ?
- 2. Give an example of polynomial $f(x)$, $g(x)$ and $r(x)$ satisfying $f(x) = g(x).q(x) + r(x)$, where degree of $r(x) = 0$.
- 3. In $\triangle ABC$ and $\triangle DEF$
 $AB/DE = BC/DF$, are the two triangles similar ?
- 4. Find the value of $\cos 48^\circ - \sin 42^\circ$
- 5. If α, β be the roots of a quadratic equation then frame the quadratic equation.
- 6. Find the distance between the points $P(a, b)$, $Q(-a, -b)$



Handwritten equation: $\frac{AB}{DE} = \frac{AC}{DF}$

SECTION - B

Find the value of K so that the following system of equations has no solution

$$3x - y - 5 = 0$$

$$6x - 2y + k = 0$$

Handwritten notes for solving the system:

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

$$\frac{3}{6} = \frac{-1}{-2} \neq \frac{-5}{k}$$

Handwritten formula: $D = b^2 - 4ac$

Handwritten notes for a system of linear equations:

$$-a + -b \quad a + b$$

$$-a - b \quad a + b$$

$$-a - b \quad a + b$$

$$-a - b \quad a + b$$

Handwritten calculation: $\frac{90}{48} = \frac{15}{8}$

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- 8. The 17th term of an A.P. exceeds its 10th term by 7. Find the common difference.
- 9. Show that $2\sqrt{3} - 1$ is an irrational number.
- 10. If one zero of the polynomial $(a^2 + 9)x^2 + 13x + 6a$ is reciprocal of the other. Find the value of a.
- 11. Find the value of m so that the quadratic equation $mx(x - 7) + 49 = 0$ has two equal roots.
- 12. Show that $(-2, 3)$, $(8, 3)$ and $(6, 7)$ are the vertices of a right angled triangle.

SECTION - C

- 13. Show that only one of the numbers n, n + 2 and n + 4 is divisible by 3.
- 14. Find all the zeroes of $2x^4 - 9x^3 + 5x^2 + 3x - 1$, if two of its zeroes are $2 + \sqrt{3}$ and $2 - \sqrt{3}$.
- 15. Draw the graphs of the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the co-ordinates of vertices of the triangle formed by these lines and the x-axis and shade the triangular region.
- 16. Two water taps together can fill the tank in $9\frac{3}{8}$ hrs. The tap of larger diameter takes 10 hrs. less than the smaller one to fill the tank. Find the time in which each tap can separately fill the tank.
- 17. The sum of the first sixteen term of an A.P. is 112 and the sum of its next fourteen terms is 518. Find the A.P.
- 18. State and prove Pythagoras theorem.
- 19. Find the value of k if the points $(k, 3)$, $(6, -2)$ and $(-3, 4)$ are collinear.
- 20. Evaluate :

$$(\sin^2 25^\circ + \sin^2 65^\circ) + \sqrt{3} \tan 5^\circ \cdot \tan 15^\circ \cdot \tan 30^\circ \cdot \tan 75^\circ \cdot \tan 85^\circ$$

- 21. Solve the following pair of equations :

$$\frac{10}{x+y} + \frac{2}{x-y} = 4$$

$$\frac{15}{x+y} - \frac{5}{x-y} = -2$$

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Handwritten notes and calculations:

- $(12, 3)$ (0, 2)
- $a^2 - b^2 = 4ac$
- $(x-7) - 4x + mx + 49 = 0$
- $7x - 4mx + 49 = 0$
- $17 = a + (n-1)d$
- $3m + 49 = 0$
- $m = 3$
- $\frac{1}{x} + \frac{1}{(x+10)}$
- $\frac{a}{17} - \frac{a}{10} = 2 \cdot \frac{1}{x} + \frac{1}{(x+10)}$
- $\frac{a}{16} - \frac{a}{9} = \dots$
- $\frac{42}{13} \cdot \frac{x+10-x}{x(x+10)}$
- $\frac{55}{55}$

22. In an equilateral $\triangle ABC$, D is a point on side BC such that $BD = \frac{1}{3} BC$. Prove that $9AD^2 = 7AB^2$.

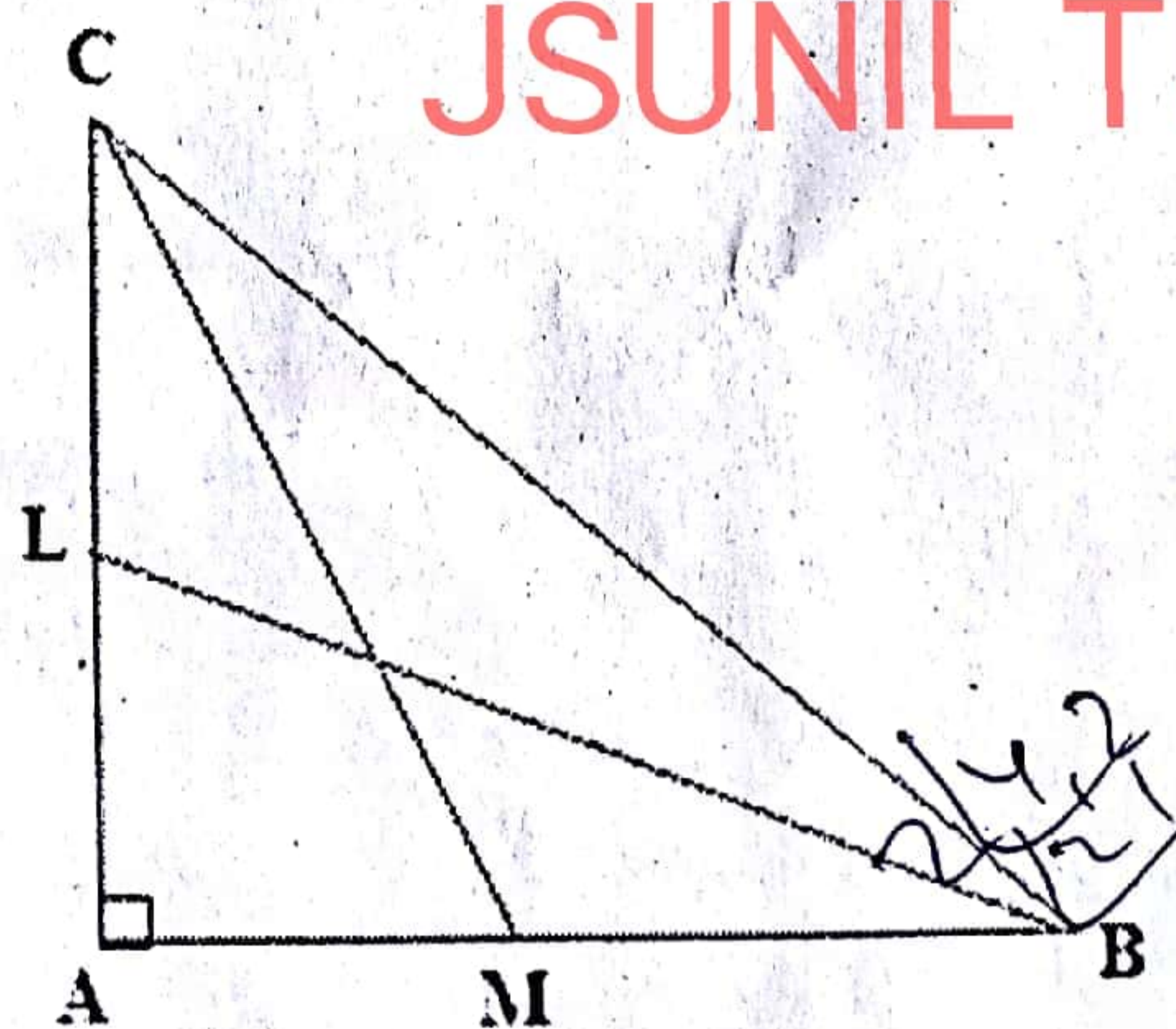
SECTION - D

23. In a class test the sum of Gagan marks in Mathematics and English is 45. If he had 1 more mark in Maths and 1 less in English the product of marks would have been 500. Find the original marks obtained by Gagan in Maths and English separately.

24. Solve for x :

$$\frac{1}{x+1} + \frac{2}{x+2} = \frac{5}{x+4} \quad x \neq -1, -2, -4$$

25. In the adjacent figure BL and CM are medians of a triangle ABC right angled at A. Prove that : $4(BL^2 + CM^2) = 5 BC^2$



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$$\frac{1}{4} + \frac{3}{2} = \frac{7}{4}$$

26. Prove that "the ratio of the areas of two similar triangles is equal to the square of the ratios of their corresponding sides".

27. The mid-points of the sides of a \triangle are (3, 4), (4, 1) and (2, 0). Find the co-ordinates of vertices of the \triangle .

28. A sum of Rs. 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is Rs. 20 less than its preceding prize, find the value of each of the prizes.

29. Ritu can row downstream 20 km in 2 hrs. and upstream 4 km in 2 hrs. Find her speed of rowing in still water and the speed of the current.

30. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$ if the two zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

$$64 \div 4 = 16$$

$$68 + 39 + 4 = 111$$

