

KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
SAMPLE PAPER 03 FOR PERIODIC TEST II EXAM (2017-18)

SUBJECT: MATHEMATICS(041)

BLUE PRINT FOR HALF YEARLY EXAM: CLASS X

Chapter	VSA (1 mark)	SA – I (2 marks)	SA – II (3 marks)	LA (4 marks)	Total
Real Numbers	1(1)	2(1)	3(1)	4(1)	10(4)
Polynomials	--	2(1)	3(1)	4(1)	9(3)
Pair of Linear Equations in two variables	1(1)	--	3(1)	4(1)	8(3)
Quadratic Equations	1(1)	--	3(1)	4(1)	8(3)
Arithmetic progression	1(1)	2(1)	3(1)	4(1)	10(4)
Coordinate Geometry	--	2(1)	3(1)	4(1)	9(3)
Introduction to Trigonometry	1(1)	2(1)	6(2)	4(1)	13(5)
Triangles	1(1)	2(1)	6(2)	4(1)	13(5)
Total	6(6)	12(6)	30(10)	32(8)	80(30)

MARKING SCHEME FOR HALF YEARLY EXAM

SECTION	MARKS	NO. OF QUESTIONS	TOTAL
VSA	1	6	08
SA – I	2	6	12
SA – II	3	10	30
LA	4	8	32
GRAND TOTAL			80

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SUBJECT: MATHEMATICS
CLASS : X

MAX. MARKS : 80
DURATION : 3 HRS

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains **30** questions divided into four Sections A, B, C and D.
- (iii). **Section A** comprises of 6 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 10 questions of **3 marks** each and **Section D** comprises of 8 questions of **4 marks** each.
- (iv). Use of Calculators is not permitted

SECTION – A

1. Find the [HCF \times LCM] for the numbers 100 and 190.
2. A girl walks 200 towards East and then she walks 150m towards North. Find the distance of the girl from the starting point.
3. For what values of k will the following pair of linear equations have infinitely many solutions?
 $kx + 3y - (k - 3) = 0$ and $12x + ky - k = 0$
4. The angles of a quadrilateral are in AP whose common difference is 10° . Find the angles.
5. Find the values of k for quadratic equation $2x^2 - x + k = 0$, so that they have two equal roots.
6. If $\tan\theta = \frac{15}{8}$, find the value of $\sin\theta$.

SECTION – B

7. Find the quadratic polynomial whose zeroes are $7 + \sqrt{3}$ and $7 - \sqrt{3}$.
8. $\triangle ABC \sim \triangle DEF$ and their areas be, respectively, 64 cm^2 and 121 cm^2 . If $EF = 15.4 \text{ cm}$, find the value of BC
9. Which term of the AP 24, 21, 18, 15, is first negative term?
10. Show that 6^n cannot end with the digit 0 or 5 for any natural number n .
11. If $\cos\alpha = \frac{1}{2}$ and $\tan\beta = \frac{1}{\sqrt{3}}$. Find $\sin(\alpha + \beta)$ where α and β are both acute angles.
12. Find the coordinates of the point which divides the line segment joining the points $(4, -3)$ and $(8, 5)$ in the ratio 3 : 1 internally.

SECTION – C

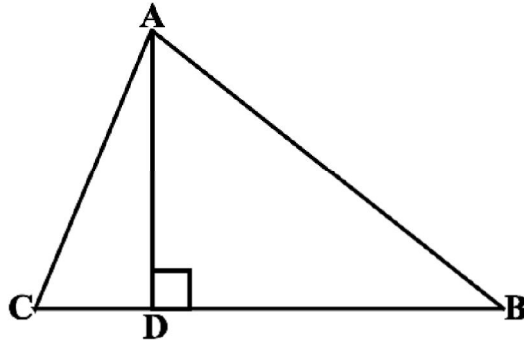
13. If α, β are the zeroes of the polynomials $f(x) = x^2 - 3x + 6$, then find the value of
$$\frac{1}{\alpha} + \frac{1}{\beta} + \alpha^2 + \beta^2 - 2\alpha\beta$$

14. If $\cos(A - B) = \frac{\sqrt{3}}{2}$ and $\sin(A + B) = 1$, then find the value of A and B.

15. Solve for x and y: $\frac{1}{2(2x+3y)} + \frac{12}{7(3x-2y)} = \frac{1}{2}$; $\frac{7}{(2x+3y)} + \frac{4}{(3x-2y)} = 2$.

16. Evaluate: $\frac{2 \sin 68^\circ}{\cos 22^\circ} - \frac{2 \cot 15^\circ}{5 \tan 75^\circ} - \frac{3 \tan 45^\circ \tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ}{5}$

17. The perpendicular from A on side BC of a ΔABC intersects BC at D such that $DB = 3 CD$ (see the below figure). Prove that $2 AB^2 = 2 AC^2 + BC^2$.



18. If AD and PM are medians of triangles ABC and PQR, respectively where $\Delta ABC \sim \Delta PQR$, prove that $\frac{AB}{PQ} = \frac{AD}{PM}$

19. Prove that $7 - 2\sqrt{3}$ is an irrational number.

20. If m times the m th term of an AP is equal to n times its n th term, find the $(m + n)$ th term of the AP.

21. Find the point on the x -axis which is equidistant from $(2, -5)$ and $(-2, 9)$.

22. Find the roots of the equation $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$, $x \neq -4, 7$.

SECTION – D

23. Prove that “The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.”

24. Find all the zeroes of the polynomial $2x^4 + 7x^3 - 19x^2 - 14x + 30$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

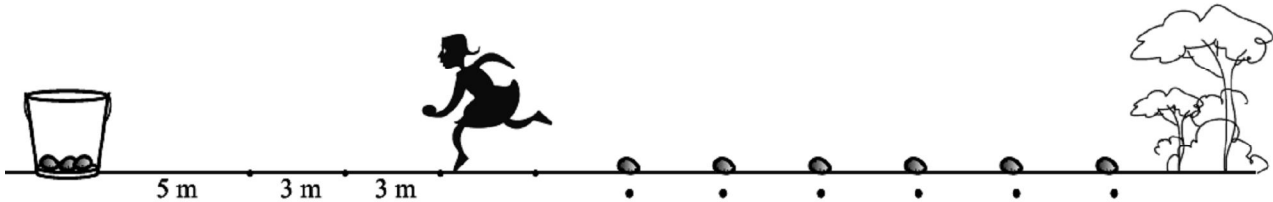
25. Use Euclid’s division lemma to show that the cube of any positive integer is of the form $9m$, $9m + 1$ or $9m + 8$.

26. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $(0, -1)$, $(2, 1)$ and $(0, 3)$. Find the ratio of this area to the area of the given triangle.

27. Prove that: $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = 1 + \sec A \operatorname{cosec} A$.

28. Draw the graphs of the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.

29. In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line (see the below figure).



A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?

30. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

