10th Standard

Arivaali

MATHEMATICS

Question Bank

COLLECTION OF
GOVT. BOARD EXAM. QUESTION PAPERS

SEPTEMBER 2020 SEPTEMBER 2021 MAY 2022 ; AUGUST 2022 APRIL 2023 ; JUNE 2023 APRIL 2024 ; JULY 2024 APRIL 2025 ; JULY 2025 APRIL 2026 ; JULY 2026	NUMBER OF QUESTION PAPERS **12**

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Topics for Scoring Marks Easily in 10th Standard Mathematics

Qn. No.	Topics	Marks	Total
1 - 14	Book Back Multiple Choice Questions (125)	14	53 Only the simple practice is enough
43	Practical Geometry Questions	8	
44	Graph Questions	8	
15, 16, 29	Unit-1 (2, 5 Mark Questions)	9	
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19 - 20 32 - 35	Unit-3 (2, 5 Mark Questions)	14	
21 - 23 36 - 37	Unit-5 (2, 5 Mark Questions)	7	
24 - 25 38	Unit-6 (2, 5 Mark Questions)	7	
26 - 27 39 - 40	Unit-7 (2, 5 Mark Questions)	7	
	Total Marks		100

GOVT. BOARD EXAM QUESTION PAPER : X - STD : SEPTEMBER-2020

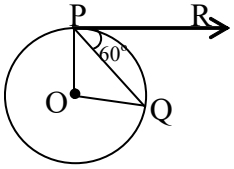
Time Allowed : 3.00 Hours] **MATHEMATICS** **[Maximum Marks: 100**

PART - I

Note: (i) Answer **all** the questions. $14 \times 1 = 14$

(ii) Choose the most appropriate answer from the given **four** alternatives and write the option code and the corresponding answer.

1. If A = {1, 2}, B = {1, 2, 3, 4}, C = {5, 6} and D = {5, 6, 7, 8}, then state which of the following statements is true?
   (a) $(A \times C) \subset (B \times D)$ (b) $(B \times D) \subset (A \times C)$
   (c) $(A \times B) \subset (A \times D)$ (d) $(D \times A) \subset (B \times A)$
2. Let $f(x) = x^2 - x$, then $f(x - 1) - f(x + 1)$ is
   (a) $4x$ (b) $2 - 2x$ (c) $2 - 4x$ (d) $4x - 2$
3. Using Euclid's division lemma, if the cube of any positive integer is divided by 9, then the possible remainders are
   (a) 0, 1, 8 (b) 1, 4, 8 (c) 0, 1, 3 (d) 1, 3, 5
4. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + ... + 2^0$, which of the following is true?
   (a) B is 2^{64} more than A (b) A and B are equal
   (c) B is larger than A by 1 (d) A larger than B by 1
5. $\frac{a^2}{a^2-b^2}+\frac{b^2}{b^2-a^2} =$
   (a) $a - b$ (b) $a + b$ (c) $a^2 - b^2$ (d) 1
6. Transpose of a column matrix is
   (a) unit matrix (b) diagonal matrix (c) column matrix (d) row matrix
7. In ΔLMN, $\angle L = 60^\circ$, $\angle M = 50^\circ$. If $\Delta LMN \sim \Delta PQR$, then the value of $\angle R$ is
   (a) 40° (b) 70° (c) 30° (d) 110°
8. In the figure, if PR is tangent to the circle at P and O is the centre of the circle, then $\angle POQ$ is



   (a) 120° (b) 100° (c) 110° (d) 90°
9. The straight line given by the equation $x = 11$ is
   (a) Parallel to x-axis (b) Parallel to y-axis
   (c) Passing through the origin (d) Passing through the point (0, 11)

10. If $\tan\theta + \cot\theta = 2$, then the value of $\tan^2\theta + \cot^2\theta$ is
    (a) 0 (b) 1 (c) 2 (d) 4
11. A child reshapes a cone made up of clay of height 24 cm and radius 6 cm into a sphere, then the radius of sphere is
    (a) 24 cm (b) 12 cm (c) 6 cm (d) 48 cm
12. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$ is
    (a) 2 : 1 (b) 1 : 2 (c) 4 : 1 (d) 1 : 4
13. The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all deviations is
    (a) 40000 (b) 160900 (c) 160000 (d) 30000
14. If a letter is chosen at random from the English alphabets $\{a, b, c, ..., z\}$, then the probability that the letters chosen precedes x, is
    (a) $\frac{12}{13}$ (b) $\frac{1}{13}$ (c) $\frac{23}{26}$ (d) $\frac{3}{26}$

PART - II

Note: Answer **any 10** questions. Question No. **28** is **compulsory**. $10 \times 2 = 20$

15. If $A \times B = \{(3,2), (3,4), (5,2), (5,4)\}$, then find A and B.
16. Show that the function $f: N \to N$ defined by $f(m) = m^2 + m + 3$ is one-one function.
17. If m, n are natural numbers, for what values of m, does $2^n \times 5^m$ end in 5?
18. Find the 3rd and 4th terms of a sequence, if $a_n = \begin{cases} n^2 & \text{if n is odd} \\ \frac{n^2}{2} & \text{if n is even} \end{cases}$
19. Find the value of $1^2 + 2^2 + 3^2 + ... + 10^2$ and hence deduce $2^2 + 4^2 + 6^2 + ... + 20^2$.
20. Find the value of k for which the equation $9x^2 + 3kx + 4 = 0$ has real and equal roots.
21. If $A = \begin{pmatrix} \sqrt{7} & -3 \\ -\sqrt{5} & 2 \\ \sqrt{3} & -5 \end{pmatrix}$ then find the transpose of $-A$.
22. Check whether AD is bisector of $\angle A$ of ΔABC in the following.
    AB = 5 cm, AC = 10 cm, BD = 1.5 cm and CD = 3.5 cm.
23. Find the slope of a line joining the points (14, 10) and (14, –6).
24. Prove: $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sec\theta + \tan\theta$
25. Find the diameter of a sphere whose surface area is 154 m^2.

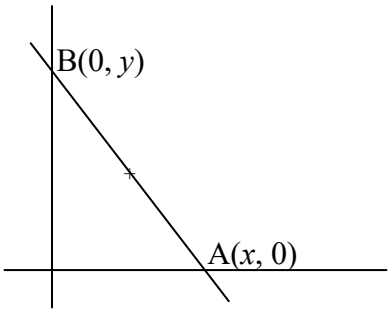
26. If the base area of a hemispherical solid is 1386 sq. metres, then find its total surface area.
27. Find the range and coefficient of range of the data. 63, 89, 98, 125, 79, 108, 117, 68.
28. Find the volume of the iron used to make a hollow cylinder of height 9 cm and whose internal and external radii are 3 cm and 5 cm respectively.

PART - III

Note: Answer **any 10** questions. Question NO. **42** is **compulsory**. $10 \times 5 = 50$

29. Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8, C = The set of even prime number. Verify that $(A \cap B) \times C = (A \times C) \cap (B \times C)$.
30. Let A = {1, 2, 3, 4} and B = {2, 5, 8, 11, 14} be two sets. Let $f: A \to B$ be a function given by $f(x) = 3x - 1$. Represent this function: (i) by Arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) in a graphical form.
31. Find the sum of all natural numbers between 100 and 1000 which are divisible by 11.
32. Solve: $6x + 2y - 5z = 13$; $3x + 3y - 2z = 13$; $7x + 5y - 3z = 26$
33. Find the GCD of the polynomials, $x^4 + 3x^3 - x - 3$ and $x^3 + x^2 - 5x + 3$.
34. Find the square root of the expression, $\frac{x^2}{y^2} - \frac{10x}{y} + 27 - \frac{10y}{x} + \frac{y^2}{x^2}$.
35. If $A = \begin{pmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{pmatrix}$ show that $(AB)^T = B^T A^T$.
36. State and prove Angle Bisector theorem.
37. Find the value of k, if the area of a quadrilateral is 28 sq. units, whose vertices are (–4, –2), (–3, k), (3, –2) and (2, 3).
38. From the top of a tower 60 m high, the angles of depression of the top and bottom of a vertical lamp post are observed to be 38° and 60° respectively. Find the height of the lamp post. (tan 38° = 0.7813, $\sqrt{3}$ = 1.732)
39. A cylindrical glass with diameter 20 cm has water to a height of 9 cm. A small non-hollow cylindrical metal of radius 5 cm and height 4 cm is immersed in it completely. Calculate the rise of water in the glass.
40. The scores of a cricketer in 7 matches are 70, 80, 60, 50, 40, 90, 95. Find the standard deviation.
41. Two unbiased dice are rolled once. Find the probability of getting: (i) a doublet (equal numbers on both dice) (ii) the product as a prime number (iii) the sum as a prime number (iv) the sum as 1.

42. A straight line AB cuts the co-ordinate axes at A and B. If the mid-points of AB is (2, 3), find the equation of AB.



PART - IV

Note: Answer **all** the questions. $2 \times 8 = 16$

43. (a) Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle ABC (scale factor $\frac{6}{5} > 1$)

OR

(b) Draw two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also measure the lengths of the tangents.

44. (a) Graph the quadratic equation $x^2 - 8x + 16 = 0$ and state the nature of their solution.

OR

(b) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$.

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10th Std. - Mathematics Board Exams. KEY for 1 Mark Questions

		September 2020
1	a	$(A \times C) \subset (B \times D)$
2	b	$2 - 2x$
3	a	0, 1, 8
4	d	A is larger than B by 1
5	d	1
6	d	row matrix
7	b	70^o
8	a	120^o
9	b	Parrallel to y-axis
10	c	2
11	c	6 cm
12	a	2 : 1
13	b	160900
14	c	$\frac{23}{26}$

		May 2022
1	d	$(3, -2)$
2	b	2
3	d	(7nd)
4	b	5
5	b	$16x^2$
6	b	1
7	d	$5\sqrt{2}$ cm
8	b	4 cm
9	c	9
10	b	1
11	c	43 m
12	a	$4\pi r^2$ sq. units
13	c	4
14	b	1

		September 2021
1	c	3
2	c	3
3	d	11
4	d	$\frac{16}{5}\left\lvert\frac{xz^2}{y}\right\rvert$
5	a	Straight line
6	a	a^m
7	a	1.4 cm
8	b	two
9	b	25 sq. units
10	c	$2+\sqrt{2}$
11	d	60^o
12	a	12 cm
13	c	3π
14	b	$\frac{7}{10}$

		August 2022
1	b	2
2	c	{4, 9, 25, 49, 121}
3	c	3
4	d	Do not intersect
5	a	$x = 1, y = 2, z = 3$
6	b	$\left[y+\frac{1}{y}\right]^2$
7	a	1.4 cm
8	b	two
9	c	(3, 5)
10	b	$-\sqrt{3}$
11	a	$\frac{h(1+\tan\beta)}{1-\tan\beta}$
12	b	1 : 4
13	c	3π
14	b	$\frac{7}{10}$