FINAL EXAMINATION: 2023-24

Date: 23/02/2024

Time: 3 hrs.

Mathematics (Set-A)

CLASS: IX

SUBJECT: MATHEMATICS

Max. Marks: 80

No. of Pages: 07

Name:			Roll	No	Class	Sec		
Genera		uctions:						
1.		Question Paper has 5 Sections A-E						
<i>2</i> .		on A has 20 MCQs carrying 1 mar						
3.	Secti	on B has 5 questions carrying 02 n	narks each.					
4.	Secti	Section C has 6 questions carrying 03 marks each.						
5.	Secti	on D has 4 questions carrying 05 i	narks each.					
6.	Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the							
	value	values of 1, 1 and 2 marks each respectively.						
7.	All Q	Questions are compulsory. Howeve	r, an internal	choice in 2 Q	s of 5 marks, 2	Qs of 3 marks		
	and .	and 2 Questions of 2 marks has been provided. An internal choice has been provided in the						
	2mar	rks questions of Section E			• • • •	,		
8	Dray	w neat figures wherever required.	Take $\pi = 22/7$	wherever requ	tired if not stat	ed.		
		OF CTY	ON A (1v2))=20\ 				
			ON - A (1x20	<u>1–20)</u>				
Multipl	le choi	ice questions- c and y be rational and irrational m	mher recnect	ively Then x	+ν is necessari	lv		
Q1.			(b)	a rational nur	nber	-5		
	(a)	a whole number	(d)	a natural nun				
	(c)	an irrational number	(u)	a natural nun				
Q2.	The	rational number 0.3 can also be w	ritten as					
Q2.			(b)	$\frac{3}{10}$				
	(a)	3						
	(c)	0.33	(ď)	$\frac{1}{3}$				
			6 than n(1)	io				
Q3.		en a polynomial $p(t) = t^4 - t^3 + t^2 +$						
	(a)	3	(b)	6 -1				
	(e)	9	(d)					
 4 Q4.	A point P(a, b) is such that: $a \le 0$, $b \ge 0$. In which quadrant does the point P lie?							
7 8);	(a)	First Quadrant	Arr	Second Qua	aran			
	(c)	Third Quadrant	(d)	Fourth Quad	rant			
_	, ,		•		and lower class	limit is 83, then		
* ^{QS}	In a continuous frequency distribution, class mark of a class is 85 and lower class limit is 83, then							
-	its upper class limit is							
	(a)	86	(b)	84				
	(c)	83	(H)	87		Class-IX		

[1]

₩ Ø	To	tal surface area of right circ	ular cone of base diar	meter 2r and slant height	I is equal to		
, ,	(a)		(10)	$\pi r + \pi r/^2$			
	(%)	$2\pi r^2$	(d)	2πτ/			
- Q7.	If v	olume and surface area of	a sphere is numericall	y equal, then its radius is	s		
	(a)	2 units	(ملكِ	3 units			
	(Q)	4 units	(d)	5 units			
Q8.	The	length of each side of an e	quilateral triangle hav	ving an area of 9√3 cm²	is		
	(a)	8 cm	(b)	36 cm			
	(c)	4 cm	(d)	6 cm			
_Q9.	AB	, CD and PQ are three che	ords of a circle with	centre O, the smallest cl	hord AB is of length		
		n, the longest chord CD is	of length 10 cm and o	chord PQ is of length 7 c	m, then radius of the		
		le is					
	(a)	1.5 cm	(b)	3.5 cm			
	(a)	5 cm	(d)	6 cm			
Q10.	AD	is a diameter of a circle as	nd AB is a chord. If A	AD = 34 cm, AB = 30 cm	n, the distance of AB		
	fror	n the centre of the circle is					
	(a)	17 cm	(b)	15 cm			
	(6)	4 cm	(d)	8 cm			
Q11.	AB	CD is a rhombus such that	$\angle ACB = 40^{\circ}$. Then \angle	ADB is			
	(4)	40°	(b)	45°			
	(c)	50°	(d)	60°			
Q12.	Fou	r points A,B,C,D are joine	d together in order and	d we noticed AB = CD =	5 cm and also, AB is		
	parallel to CD then the quadrilateral obtained is a						
	(a)	rhombus	(b)	trapezium	•		
	(c)	parallelogram	(d)	rectangle			
Q13.	In Δ	PQR , $\angle R = \angle P$ and $QR =$	4cm and PR = 5cm.	Then the length of PQ is			
	(a)	4 cm	(b)	5 cm			
	(c)	2 cm	(d)	2.5 cm			
Q14.	If A	B = QR, BC = PR and CA	= PQ, then				
-	(a)	$\triangle ABC \cong \triangle PQR$	(Ja)	$\Delta CBA \cong \Delta PRQ$			
	(c)	$\Delta BAC \cong \Delta RPQ$	(d)	$\Delta BCA \cong \Delta PQR$			
Q15.	If the	e difference between two	complementary angle	s is 10°, then the angles	are		
-	(a)	50°, 60°	(b)	50°, 40°			
	(e)	80°, 10°	(d)	35°, 45°			
 4Q16.	Ties	l is perpendicular to line	n and line m is perper	ndicular to line n, then li	ine l is to line n .		
۳۷۱٥.	Line	r is perpendicular to line /	(b)	perpendicular			
	(c)	parallel intersecting	(d)	none of these	Chare-f.Y		
Mathema			[2]		Chir.		

(a) πr² + πrl (y) 2πrl (d) 3 units (e) 4 units (d) 3 units (d) 5 units Q8. The length of each side of an equilateral triangle having an area of 9√3 cm² is (e) 8 cm (b) 36 cm (c) 4 cm (d) 6 cm (e) 3 cm, the longest chord CD is of length 10 cm and chord PQ is of length 7 cm, then radius of the circle is (a) 1.5 cm (b) 3.5 cm (d) 6 cm (d) 6 cm (e) 5 cm (d) 6 cm (d) 6 cm (d) 6 cm (e) 4 cm (d) 8 cm (d) 6 cm (d) 6 cm (d) 6 cm (d) 6 cm (e) 4 cm (d) 8 cm (e) 5 cm (d) 6 cm (e) 4 cm (d) 8 cm (e) 5 cm (d) 6 cm (e) 4 cm (d) 8 cm (e) 5 cm (e) 5 cm (d) 6 cm (d) 6 cm (e) 5 cm (e) 5 cm (e) 5 cm (f) 6 cm	★ Ø.	To	tal surface area of	right circular cone	of base dia	meter 2r and slant height / is equal to
(φ) 2πr' (d) 2πr/ (d) 2πr/ (d) 2πr/ (e) 2 units (a) 2 units (b) 3 units (b) 4 units (d) 5 units (d) 5 units (e) 4 units (d) 5 units (d) 5 units (e) 4 units (d) 5 units (d) 5 units (e) 4 units (d) 5 units (e) 3 cm² is (e) 8 cm (b) 36 cm (c) 4 cm (d) 6 cm (o) 4 cm (d) 6 cm Q9. AB, CD and PQ are three chords of a circle with centre O, the smallest chord AB is of length 3 cm, the longest chord CD is of length 10 cm and chord PQ is of length 7 cm, then radius of the circle is (a) 1.5 cm (b) 3.5 cm (d) 6 cm Q10. AD is a diameter of a circle and AB is a chord. If AD = 34 cm, ΛB = 30 cm, the distance of AB from the centre of the circle is (a) 17 cm (b) 15 cm (d) 8 cm Q11. ABCD is a rhombus such that ∠ACB = 40°. Then ∠ADB is (f) 40° (c) 50° (d) 60° Q12. Four points A,B,C,D are joined together in order and we noticed AB = CD = 5 cm and also, AB is parallel to CD then the quadrilateral obtained is a (a) rhombus (b) trapezium (d) rectangle Q13. In Δ PQR, ∠R = ∠P and QR = 4cm and PR = 5cm. Then the length of PQ is (e) 2 cm (d) 2.5 cm Q14. If AB = QR, BC = PR and CA = PQ, then (a) ΔABC ≅ ΔPQR (b) ΔCBA ≅ ΔPRQ (c) ΔBCA ≅ ΔPRQ (d) ΔBCA ≅ ΔPRQ (d) ΔBCA ≅ ΔPQR Q15. If the difference between two complementary angles is 10°, then the angles are (a) 50°, 60° (b) 50°, 40° (c) 35°, 45° (d) 35°, 45° (e) parallel (c) intersecting (d) none of these (d) none of these (d) contents (•	49	$\pi r + \pi r l^2$
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(a) 5 cm (d) 6 cm Q10. AD is a diameter of a circle and AB is a chord. If AD = 34 cm, AB = 30 cm, the distance of AB from the centre of the circle is (a) 17 cm (b) 15 cm (b) 4 cm (d) 8 cm Q11. ABCD is a rhombus such that ∠ACB = 40°. Then ∠ADB is (a) 40° (b) 45° (c) 50° (d) 60° Q12. Four points A,B,C,D are joined together in order and we noticed AB = CD = 5 cm and also, AB is parallel to CD then the quadrilateral obtained is a (a) rhombus (b) trapezium (c) parallelogram (d) rectangle Q13. In Δ PQR, ∠R = ∠P and QR = 4cm and PR = 5cm. Then the length of PQ is (a) 4 cm (b) 5 cm (c) 2 cm (d) 2.5 cm Q14. If AB = QR, BC = PR and CA = PQ, then (a) ΔABC ≅ ΔPQR (d) ΔBCA ≅ ΔPQR (b) ΔCBA ≅ ΔPQR (c) ΔBAC ≅ ΔRPQ (d) ΔBCA ≅ ΔPQR Q15. If the difference between two complementary angles is 10°, then the angles are (a) 50°, 60° (b) 50°, 40° (b) 50°, 40° (c) 80°, 10° (d) 35°, 45° AQ16. Line l is perpendicular to line m and line m is perpendicular to line n, then line l is to line m. (b) perpendicular (c) intersecting (d) none of these (long the distance of AB cm, the distance of AB cm, then line l is line m. (long the line line line line line line line lin					(h)	3.5 cm
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(a) 50°, 60° (b) 50°, 40° (c) 80°, 10° (d) 35°, 45° (e) 80°, 10° (d) 35°, 45° (e) perpendicular to line m and line m is perpendicular to line n, then line l is to line n. (a) parallel (b) perpendicular (c) intersecting (d) none of these (last-l)			$\Delta BAC \cong \Delta RPQ$		(d)	$\Delta BCA \cong \Delta PQR$
(a) 50°, 60° (b) 50°, 40° (c) 80°, 10° (d) 35°, 45° (e) 80°, 10° (d) 35°, 45° (e) perpendicular to line m and line m is perpendicular to line n, then line l is to line n. (a) parallel (b) perpendicular (c) intersecting (d) none of these (last-l)	Q15.	If the	difference between	en two complemen	tary angles	s is 10°, then the angles are
(c) 80°, 10° (d) 35°, 45° (d) 35°, 45° (e) Robert of the second of th					(b)	50°, 40°
AQ16. Line l is perpendicular to line m and line m is perpendicular to line n, then line l is parallel (b) perpendicular (c) intersecting (d) none of these Classe IV		(e)	•			line II.
(c) intersecting (d) none of these Classelli	♣ Q16.	Line	l is perpendicular	to line m and line n	n is perpen	dicular to line n, then line t is
(c) intersecting (d) none of these Class-A					(þ)	perpendicular
	_		•		(d)	none of these Class-M
	Mathema	tics (Se		The state of the s	[2]	

- Q17. The linear equation 3y 5 = 0, represented as ax + by + c = 0, has
 - (a) a unique solution

(h) infinitely many solutions

(c) two solutions

- (d) no solution
- Q13. Which of the following needs a proof?
 - (z) Theorem

(b) Axiom

(c) Definition

- (d) Postulate
- Q19. Assertion (A): The abscissa of point (3, 5) is 3.

Reason (R) : The perpendicular distance from y-axis is called its abscissa.

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.
- Assertion (A): The zeroes of the polynomial $f(x) = x^2 5x + 6$ are 3 and 2.

Reason (R) : A linear polynomial has exactly one zero.

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

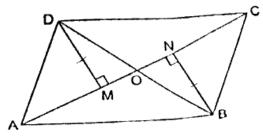
SECTION - B (2x5=10)

- Q21. Express 18.48 in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
- Q22. If $f(x) = 5x^2 4x + 5$, find f(1) + f(-1) + f(0)

OR

If (a + b + c) = 9 and (ab + bc + ca) = 26, find value of $(a^2 + b^2 + c^2)$.

- Q23. If a point C lies between two points A and B such that AC = BC, then prove that $AC = \frac{1}{2}AB$. Explain by drawing the figure.
- Q24. In quadrilateral ABCD, BN and DM are drawn perpendicular to AC. Such that BN = DM. Prove that O is mid-point of BD.

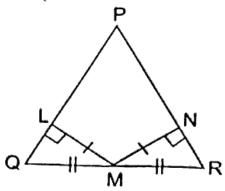


 $\frac{OR}{[3]}$

Mathematics (Set-A)

Class-IX

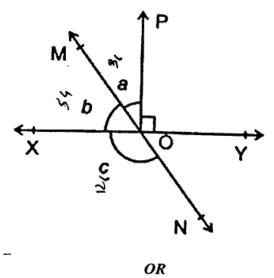
In the given figure, LM = MN, QM = MR, ML \pm PQ and MN \pm PR. Prove that PQ = PR.



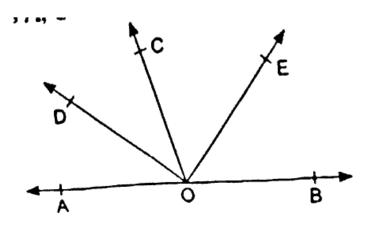
The radius of a circle is 10 cm and a chord of the circle is 12 cm in length. Find the distance of the chord from the centre of the circle.

SECTION - C (3x6=18)

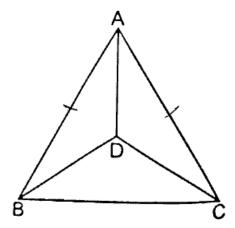
- In a one-day International Cricket match, played between India and England in Kanpur, two Indian batsmen, Yuvraj Singh and M.S. Dhoni scored 200 runs in a partnership including 5 extra runs. Express this information in the form of a linear equation in two variables. Also write the linear equation in the form of ax + by + c = 0 and indicate the values of a, b and c.
- Q27. In the given figure, lines XY and MN intersect at O. If $\angle POY = 90^{\circ}$ and a : b = 2 : 3, find c.



In the given figure, OD is bisector of $\angle AOC$, OE is the bisector of $\angle BOC$ and OD \perp OE. Show that the points A, O and B are collinear.



In the given figure, $\Delta B = AC$ and D is a point in the interior of ΔABC such that $\angle DBC = \angle DCB$. Q28. Prove that AD bisects ∠BAC of ∆ABC.



- If the diagonals of a parallelogram are equal, then show that it is a rectangle. Q29.
- **63** Find the area of a triangle whose perimeter is 180 cm and its two sides are 80 cm and 18 cm. Calculate the altitude of triangle corresponding to its shortest side.
- Q31. The volume of a right circular cone is 9856 cm³. If the diameter of the base is 28 cm, find
 - (a) height of the cone
 - slant height of the cone (b)
 - curved surface area of the cone (c)

OR

The radius of hemispherical balloon increases from 6 cm to 12 cm as air is being pumped into it. Find the ratio of surface area of balloon in the two cases. 23682

$\underline{SECTION} - D (5x4=20)$

The following table gives the distribution of students of two sections according to the marks Q32. obtained by them. https://www.cbseboardonline.com

Sec	tion A	Section B		
Marks	Frequency	Marks	Frequency	
0 – 10	3	0-10	5	
10 – 20	9	10 – 20	19	
20 – 30	17	; 20 – 30	15	
30 – 40	12	30 – 40	10	
40 - 50	9	. 40 - 50	1	

Represent the marks of the students of both the sections on the same graph by two frequency polygons. From the two polygons compare the performance of the two sections.

Q33. The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 13 m, 14 m and 15 m. The advertisement yields an earning of ₹ 2000 per m² per year. A company hired one of its walls for 6 months. How much rent did it pay?

OR

The perimeter of triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6 cm less than twice the smaller side. Find the area of the triangle.

Mathematics (Set-A) Class-IX [5]

- Q34. Find the value of a and b so that x + 1 and x 1 are factors of $x^2 + ax^3 + 2x^2 3x + b$.
- Q35. If $x = 2 + \sqrt{3}$, find the value of $x^3 + \frac{1}{x^3}$

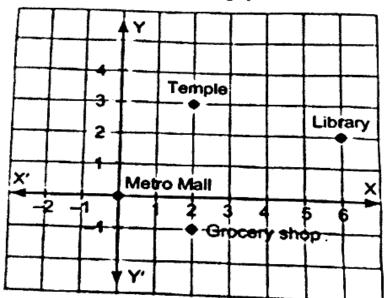
OR

Find the value of a and b if $\frac{7+\sqrt{5}}{7-\sqrt{5}}$ - $\frac{7-\sqrt{5}}{7+\sqrt{5}}$ = a + $\sqrt{5}$ b

SECTION - E (4x3=12)

Case study based questions

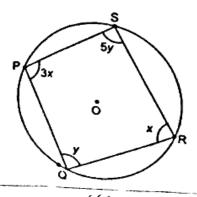
Q36. Ram, a student of class IX, is residing in a village. One day, he went to metro mall along with his brother. From there, he visited three places library, temple and grocery shop. After returning to his village, he plotted a graph by taking the metro mall as origin and marked three places on the graph as per his direction of movement and distance. The graph is shown below:



- (a) What are the coordinates of the temple?
- (b) What is the abscissa point of the library?
- (c) Write the sum of ordinates of grocery shop and temple. 2

OR

- (c) What is the distance between temple and grocery shop?
- Q37. In a residential colony, there was one circular ground. Members of the colony decided that there should be a skating area available in circular ground so that the children have opportunity to excel themselves in skating. For that purpose they chose four points P, Q, R and S and fenced the area as shown in figure.



Mathematics (Set-A)

Now answer the following questions:

- (a) What is the measure of $\angle R$?
- (b) What is the value of y?
- (c) What is measure of ∠P?

OR

- (c) What is measure of $\angle S$?
- Q38. Juhi a young girl found a spherical shaped coconut. She consumed the water of the coconut and used her creativity by decorating the outer spherical covering of the coconut and sold it. If the radius of coconut was 2.1 cm (considering the thickness of coconut negligible and coconut-fetty filled with water) then, based on the above situation, answer the following questions:



- (a) What will be the surface area of spherical coconut?
- (b) If Juhi could decorate only half coconut using paper then what would be the area of required paper?
- (c) If the price for decorating coconut is ₹5 per square cm then what would be price of decorating the whole coconut?

OR

(c) What was the volume of coconut water Juhi consumed?

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