ROLL NUMBER					

SET	A

INDIAN SCHOOL MUSCAT
FINAL EXAMINATION 2022-23
MATHEMATICS (041)

CLASS : IX
DATE: 13-02-2023

TIME ALLOTED : 3HRS.
MAXIMUM MARKS: 80

GENERAL INSTRUCTIONS:

***All Questions must be attempted, however there are internal choices for 2 marks, 3 marks and 5 marks questions.**
***Section A has 20 Questions of 1 mark each.**
***Section B has 5 Questions of 2 marks each.**
***Section C has 6 Questions of 3 marks each.**
***Section D has 4 Questions of 5 marks each.**
***Section E has 3 case-based Questions of 4 marks each.**
***Use of calculator is not permitted.**
***Write your paper neatly without the use of white ink.**

SECTION -A

1. The number 1.101001000100001... is 1
   (a) a natural number (b) a whole number
   (c) a rational number (d) an irrational number
2. In triangles ABC and $PQR, AB = AC, \angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are: 1
   a) Isosceles but not congruent b) Isosceles and congruent
   c) Congruent but not isosceles d) Neither congruent nor isosceles
3. The standard form of the linear equation $y + 3x = 5$ in 2 variables is 1
   (a) $3x + y - 5 = 0$ (b) $x + 3y - 5 = 0$
   (c) $3x + y + 5 = 0$ (d) $3x - y - 5 = 0$
4. An angle that is 14° more than its complementary angle 1
   (a)104° (b)52° (c)74° (d)25°
5. Every Rational number is 1
   (a) a natural number (b) a whole number
   (c) a real number (d) an irrational number
6. Which point lies on x-axis? 1
   (a) (3, 2) (b) (-3, 2) (c) (2, 0) (d) (-1,-2)
7. The relation between h, r and l of a right circular cone is 1
   (a) $h = l + r$ (b) $h^2 = l^2 + r^2$ (c) $l^2 = h^2 + r^2$ (d) $l^2 = h^2 - r^2$
8. The class mark of the class interval 30 - 40 is 1
   (a) 30 (b) 40 (c) 45 (d) 35

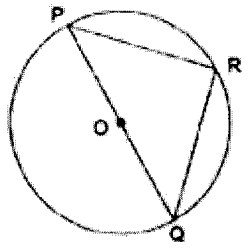
9. A chord is at a distance of 12 cm from the centre of a circle of radius 13 cm. The length of the chord is 1
(a) 12 cm (b) 13 cm (c) 10 cm (d) 26 cm

10. $x^2 + 5x - 1$ is a 1
(a) quadratic polynomial in x (b) binomial
(c) monomial (d) cubic polynomial in x

11. In the class intervals 40 – 50, 50 – 60, the number 50 is included in which of the following? 1
(a) 40 – 50 (b) 30 – 40 (c) 50 – 60 (d) 60 – 70

12. The radius of a sphere is 2r, then its volume will be 1
(a) $\frac{4}{3}\pi r^3$ (b) $4\pi r^3$ (c) $\frac{8}{3}\pi r^3$ (d) $\frac{32}{3}\pi r^3$

13. In the figure, O is the centre of the circle and PR = QR. What is the measure of ∠PQR? 1
(a) 60° (b) 110°
(c) 75° (d) 45°



14. Degree of zero polynomial is 1
(a) 0 (b) any natural number (c) 1 (d) not defined

15. The angles of the quadrilateral are in the ratio 4: 5: 10: 11. The angles are 1
(a). $36°, 60°, 108°, 156°$ (b). $48°, 60°, 120°, 132°$
(c). $52°, 60°, 122°, 126°$ (d). $60°, 60°, 120°, 120°$

16. The range of the data: 24, 23, 28, 29, 35, 17and 13 is 1
(a)22 (b)48 (c)6 (d)12

17. In ΔABC, BC = AB and ∠B = 80°. Then ∠A is equal to: 1
a) 80° b) 40° c) 50° d) 100°

18. Which of the following is a zero of the polynomial $x^3 + 3x^2 - 3x - 1$? 1
(a) –1 (b) –2 (c) 1 (d) 2

19. **Assertion:** Point $A(-7, -9)$ lies on III quadrant 1
Reason: A point both of whose coordinates are negative lies in III quadrant
a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
b.) Both Assertion & Reason are correct and Reason is not the correct explanation for Assertion.
c.) Assertion is true but the Reason is false.
d.) Both assertion and Reason are false

20. **Assertion:** There can be infinite number of equal chords of a circle. 1
Reason: A circle has only finite number of equal chords.
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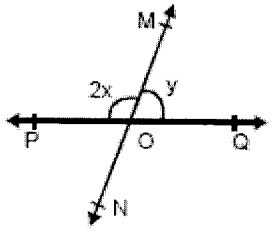
SECTION -B

21. Evaluate (103×99) without multiplying directly. 2

22. In the given figure, Lines PQ & MN intersect at O. 2

(a) Determine y, when x = 60°.

(b) Determine x, when y = 40°.



23. Find any 2 solutions of the equation $x - 2y = 4$. 2

24. Expand using suitable identity: $(2x - 5)^3$ 2

OR

Verify that $(x - y)(x^2 + xy + y^2) = x^3 - y^3$

25. If the circumference of the base of a right circular cone is 220 cm, then find its base area. 2

OR

The surface area of a sphere is $484\pi\ cm^2$. Find its diameter.

SECTION -C

26. Convert 0.252525….. into a rational number. (Steps to be shown) 3

OR

Simplify $(3\sqrt{3} + 2\sqrt{2})(2\sqrt{3} + 3\sqrt{2})$

27. Prove that equal chords of a circle subtend equal angles at the center. 3

OR

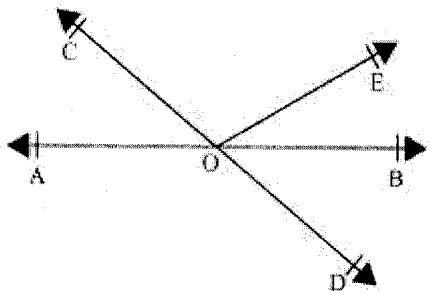
If the non-parallel sides of a trapezium are equal, then prove that it is cyclic.

28. The scores of an English test out of 100 of 20 students are given below: 3

75, 69, 88, 55, 95, 88, 73, 64, 75, 98, 88, 95, 90, 95, 88, 44, 59, 67, 88, 99.

Construct a grouped frequency distribution table taking class width equal to 20 in such a way that the mid-value of the first class is 50.

29. In the given figure, lines AB and CD intersect at O. If $\angle AOC + \angle BOE = 70°$, and $\angle BOD = 40°$, find $\angle BOE$ and reflex $\angle COE$. 3



30. Find the value of k, if $(k, -1)$ is a solution of the equation $3x - ky = 8$. 3

31. Draw a histogram for the following data. 3

Marks Obtained	Number of Students
20 – 30	7
30 – 40	12
40 – 50	6
Total	25

SECTION -D

32. State factor Theorem. Using factor theorem, factorize the polynomial: 5

$x^3 - 6x^2 + 3x + 10$.

33. (a)Represent $\sqrt{5}$ on a number line. 5

(b)Rationalize the denominator: $\frac{2}{\sqrt{3}-1}$

34. E is the midpoint of median AD of ΔABC and BE is produced to meet AC at F. Show that $AF = \frac{1}{3}AC$. 5

OR

P is the mid-point of the side CD of a parallelogram ABCD. A line through C parallel to PA intersects AB at Q and DA produced at R. Prove that DA = AR and CQ = QR.

35. Twenty-seven solid iron spheres, each of radius **r** and surface area **S** are melted to form a sphere with surface area **S'** find the 5

(i) radius **r′** of the new sphere

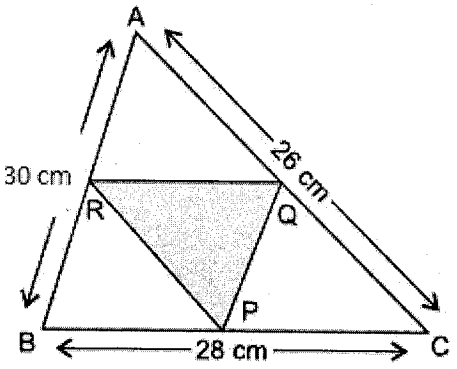
(ii) ratio of **S** and **S′**

OR

If volume and surface area of a solid hemisphere are numerically equal, then what is the circumference of base of hemisphere? Also find its curved surface area.

SECTION -E

36. Sakshi prepared a Rangoli in triangular shape on Diwali. She makes a small triangle under a big triangle as shown in the figure, Sides of big triangle are 26 cm 28 cm and 30 cm. Also triangle PQR is formed by joining the midpoints of sides of triangle ABC. Use the above data to answer the following questions 4



(a)What are the measures of the sides of triangle PQR?

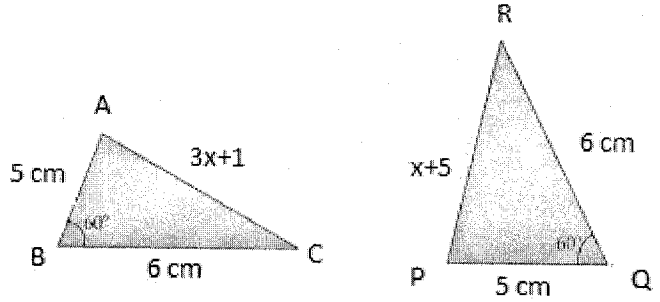
(b)Find the semi perimeter of triangle ABC.

(c)Find the area of triangle ABC. (Show the working)

OR

Find the perimeter of triangle PBR. (Show the working)

37. Two friends Rohan and Mohan have triangular fields ABC and PQR respectively as given below. 4



Answer the following questions.

(a)Name the congruence rule by which ABC and PQR are congruent.

(b) Which statement of the following is incorrect for the given information.

(i) Side AB = Side PQ (ii) Angle B = Angle Q

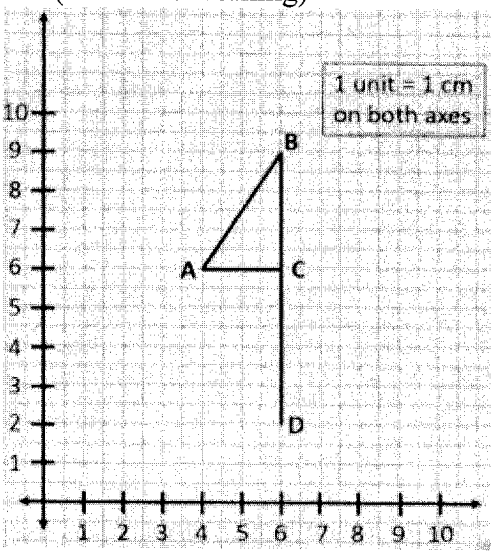
(iii) Side QR = Side AB (iv) Side BC = Side QR

(c)Find the value of x. (Show the working)

OR

Find the measure of side AC of triangle ABC. (Show the working)

38. The sketch of a flag post is created on a graph paper as shown aside. Using the details given, answer the following questions. 4



(a) Find the coordinates of point A.

(b) Find the point whose x and y coordinates are same.

(c) Find the distance between A and B. (Show the working)

OR

Find the area of triangle ABC. (Show the working)

******END OF THE QUESTION PAPER******

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SECTION -A

1. In ΔABC, $BC = AB$ and $\angle B = 80°$. Then $\angle A$ is equal to: 1
   a) 80° b) 40° c) 50° d) 100°
2. Degree of zero polynomial is 1
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3. The range of the data: 24, 23, 28, 29, 35, 17and 13 is 1
   (a)22 (b)48 (c)6 (d)12
4. In the class intervals 40 – 50, 50 – 60, the number 50 is included in which of the following? 1
   (a) 40 – 50 (b) 30 – 40 (c) 50 – 60 (d) 60 – 70
5. The number 2.303003000300003... is 1
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6. An angle that is 14° more than its complementary angle 1
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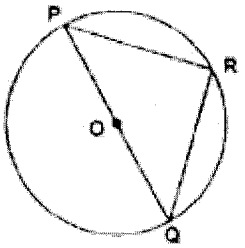
7. In the figure, O is the centre of the circle and PR = QR. What is the measure of ∠PQR? 1



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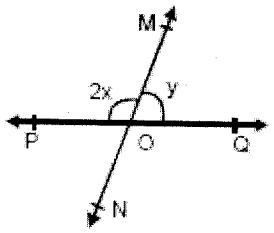

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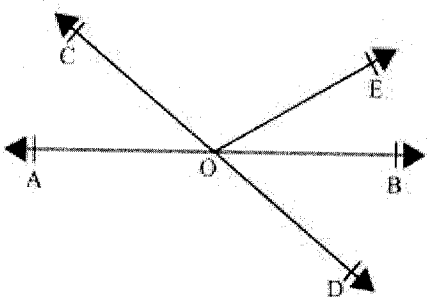

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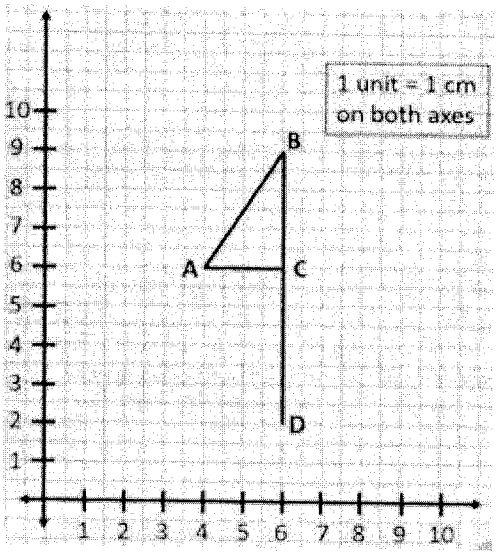

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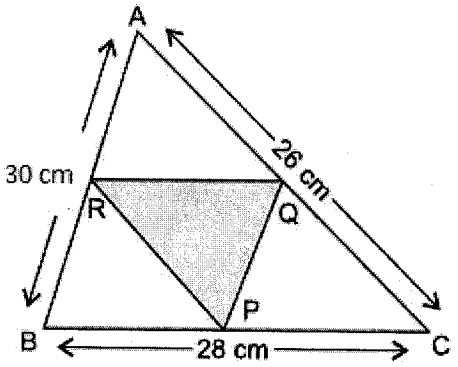

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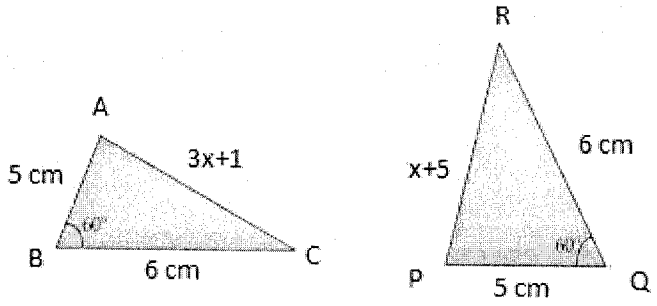

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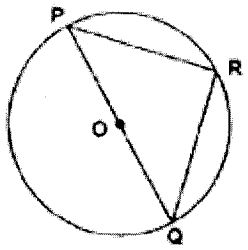

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19. **Assertion:** Point $R(-3, -7)$ lies on III quadrant 1
Reason: A point both of whose coordinates are negative lies in III quadrant
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b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
c.) Assertion is true but the Reason is false.
d.) Both Assertion and Reason are false

20. **Assertion:** There can be infinite number of equal chords of a circle. 1
Reason: A circle has only finite number of equal chords.
a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
c.) Assertion is true but the Reason is false.
d.) Both Assertion and Reason are false

SECTION -B

21. Find any 2 solutions of the equation $x - 2y = 4$. 2
22. Evaluate (103×99) without multiplying directly. 2
23. Expand using suitable identity: $(2x - 5)^3$ 2

OR

Verify that $(x - y)(x^2 + xy + y^2) = x^3 - y^3$

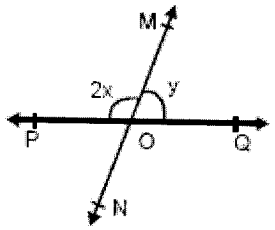
24. If the circumference of the base of a right circular cone is 220 cm, then find its base area. 2

OR

The surface area of a sphere is $484\pi\ cm^2$. Find its diameter.

25. In the given figure, Lines PQ & MN intersect at O. 2

(a) Determine y, when x = 60°.
(b) Determine x, when y = 40°.



SECTION -C

26. Prove that equal chords of a circle subtend equal angles at the center. 3

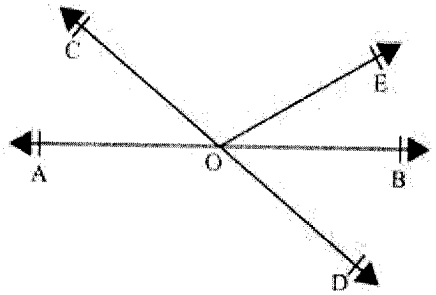
OR

If the non-parallel sides of a trapezium are equal, then prove that it is cyclic.

27. Draw a histogram for the following data. 3

Marks Obtained	Number of Students
20 – 30	5
30 – 40	13
40 – 50	7
Total	25

28. In the given figure, lines AB and CD intersect at O. If $\angle AOC + \angle BOE = 70°$, and $\angle BOD = 40°$, find $\angle BOE$ and reflex $\angle COE$. 3



29. Find the value of k, if $(k, -1)$ is a solution of the equation $3x - ky = 8$. 3
30. The scores of an English test out of 100 of 20 students are given below: 3
75, 69, 88, 55, 95, 88, 73, 64, 75, 98, 88, 95, 90, 95, 88, 44, 59, 67, 88, 99.
Construct a grouped frequency distribution table taking class width equal to 20 in such a way that the mid-value of the first class is 50.
31. Convert 0.242424….. into a rational number. (Steps to be shown) 3

OR

Simplify $(3\sqrt{3} + 2\sqrt{2})(2\sqrt{3} + 3\sqrt{2})$

SECTION -D

32. E is the midpoint of median AD of ΔABC and BE is produced to meet AC at F. Show that $AF = \frac{1}{3}AC$. 5

OR

P is the mid-point of the side CD of a parallelogram ABCD. A line through C parallel to PA intersects AB at Q and DA produced at R. Prove that DA = AR and CQ = QR.

33. Twenty-seven solid iron spheres, each of radius **r** and surface area **S** are melted to form a sphere with surface area **S'** find the 5

(i) radius $\mathbf{r'}$ of the new sphere

(ii) ratio of **S** and $\mathbf{S'}$

OR

If volume and surface area of a solid hemisphere are numerically equal, then what is the circumference of base of hemisphere? Also find its curved surface area.

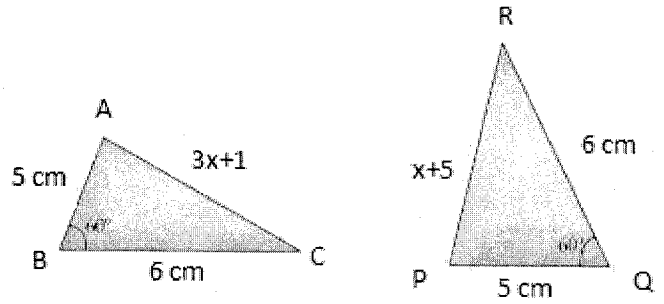
34. State factor Theorem. Using factor theorem, factorize the polynomial: 5
$x^3 - 6x^2 + 3x + 10$.

35. (a)Represent $\sqrt{5}$ on a number line. 5

(b)Rationalize the denominator: $\frac{2}{\sqrt{3}-1}$

SECTION -E

36. Two friends Rohan and Mohan have triangular fields ABC and PQR respectively as given below. 4



Answer the following questions.

(a)Name the congruence rule by which ABC and PQR are congruent.

(b)Which statement of the following is incorrect for the given information.

(i) Side AB = Side PQ (ii) Angle B = Angle Q

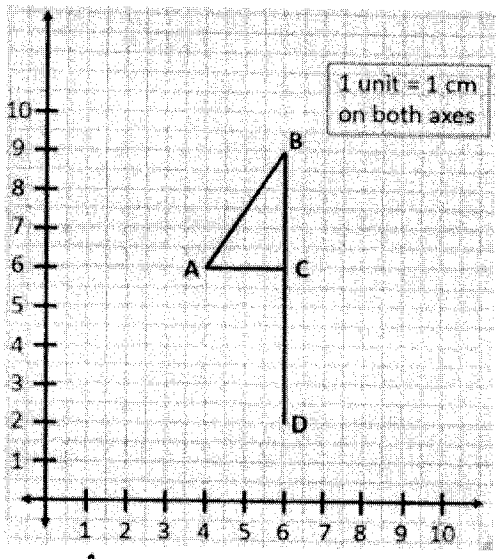
(iii) Side QR = Side AB (iv) Side BC = Side QR

(c)Find the value of x. (Show the working)

OR

Find the measure of side AC of triangle ABC. (Show the working)

37. The sketch of a flag post is created on a graph paper as shown aside. Using the details given, answer the following questions. 4

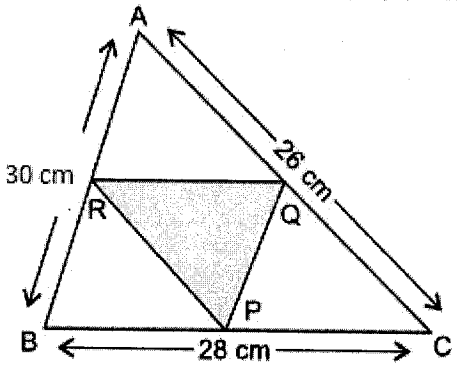


(a) Find the coordinates of point A.
(b) Find the point whose x and y coordinates are same.
(c) Find the distance between A and B. (Show the working)

OR

Find the area of triangle ABC. (Show the working)

38. Sakshi prepared a Rangoli in triangular shape on Diwali. She makes a small triangle under a big triangle as shown in the figure, Sides of big triangle are 26 cm 28 cm and 30 cm. Also triangle PQR is formed by joining the midpoints of sides of triangle ABC. Use the above data to answer the following questions 4



(a)What are the measures of the sides of triangle PQR?
(b)Find the semi perimeter of triangle ABC.
(c)Find the area of triangle ABC. (Show the working)

OR

Find the perimeter of triangle PBR. (Show the working)

******END OF THE QUESTION PAPER******