MODEL QUESTION PAPER (2024-2025)
SEMESTER I
SUBJECT: MATHEMATICS

Time: 3 hrs **GRADE 9** **Max. Marks: 80**

INSTRUCTIONS:

i) This question paper consists of **55** questions. All questions are compulsory.
ii) This question paper is divided into four Sections.-**A , B , C** and **D**.
iii) In **Section A**, Question Nos. **1 to 40** are multiple choice questions **(MCQs)** carrying **1 mark** each which are to be answered on an **OMR** sheet. The **OMR** sheet shall be collected after **90 mins**.
iv) In **Section B**, Question Nos. **41 to 47** are short answer type I **(SA-I)** questions carrying **2 marks** each.
v) In **Section C**, Question Nos. **48 to 53** are short answer type II **(SA-II)** questions carrying **3 marks** each.
vi) In **Section D**, Question Nos. **54 and 55** are long answer **(LA)** questions carrying **4 marks** each.
vii) There is no overall choice. However, an internal choice has been provided in **three** questions of **2 marks** each in **Section B** and two questions of **3 marks** each in **Section C.**
viii) In questions on constructions, the drawing should be clear and exactly as per given measurements. The construction lines and arcs should also be maintained.
ix) Graph page **will be provided on request**.
x) Use of calculator is not permitted.

Section A (1 mark each)

Choose the correct alternative from those given below each statement:

1. The number $\frac{a}{b}$, where 'a' and 'b' are integers , is not a rational number if 'b' is :

A. -1

B. 0

C. 1

D. 10

2. Which of the following is an irrational number ? :

A. $\sqrt{5}+\sqrt{5}$

B. $\sqrt{5}--\sqrt{5}$

C. $\sqrt{5}x\sqrt{5}$

D. $\sqrt{5} \div \sqrt{5}$

3. The rational number which has a terminating decimal expansion is :

A. $\frac{3}{11}$

B. $\frac{20}{7}$

C. $\frac{9}{8}$

D. $\frac{13}{3}$

4. The degree of a non-zero constant polynomial is :

A. 0

B. 1

C. 2

D. 3

5. The zero of the polynomial $\frac{5}{3}x$ is :

A. $\frac{-5}{3}$

B. $\frac{-3}{5}$

C. 0

D. $\frac{3}{5}$

6. The equation of the x-axis is given by :

A. $x = 0$

B. $y = 0$

C. $x = 1$

D. $y = 1$

7. A graph of a linear equation in two variables is a:

A. circle

B. semicircle

C. curve

D. straight line

8. If $(3, -2)$ lies on the graph of $5x+ky=11$, then the value of 'k' is :

A. -7

B. -2

C. 2

D. 7

9. The relation between $\sin\theta$,cosθ and tan θ is:

A. Sin θ +cos θ=tan θ

B. Sin θ -cos θ=tan θ

C. Sin θ ×cos θ=tan θ

D. Sin θ÷ $cos\theta$ = tan θ

10. The value of $\tan^2 30^0$ is :

A. $\frac{1}{\sqrt{3}}$

B. $\frac{1}{3}$

C. $\sqrt{3}$

D. 3

11. In ΔABC, if ∠A = 4x°, ∠B = 24° and ∠C = 36°, then the value of 'x' is :

A. 30

B. 60

C. 75

D. 120

12. The complement of an angle of measure (58 + a)° is :

A. (32 +a)°

B. (122 – a)°

C. (32 -a)°

D. (122 +a)°

13. If ∠RTM is an exterior angle of ΔRST, ∠R = 70° and ∠S = 25°, then the measure of ∠RTM is :

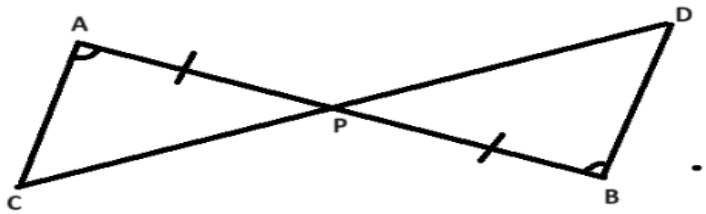
A. 45°

B. 85°

C. 95°

D. 110°

14. In the figure, if P is the mid-point of AB and ∠CAP = ∠DBP, then the congruence rule by which ΔAPC ≅ ΔBPD is :



A. SAS

B. ASA

C. AAS

D. RHS

15. If the largest side of a triangle is 12 cm, then the other two sides can be:

A. 7.6 cm, 3.4 cm

B. 6.4 cm, 2.8 cm

C. 4.2 cm, 7.8 cm

D. 4.8 cm, 8.2 cm

16. If both diagonals of a parallelogram are equal, then it is a:

A. Trapezium

B. Kite

C. Rectangle

D. Rhombus

17. The value of the polynomial $p(y) = 2y^3 + y^2 - 5$ at $y = -1$ is:

A. -8

B. -6

C. -4

D. -2

18. A solution of the equation 2x – y = 5 is:

A. (2, 1)

B. (4, -3)

C. (1, -3)

D. (3, 2)

19. The equation of a line parallel to the X-axis and 4 units above the origin is:

A. x = -4

B. y = -4

C. x = 4

D. y = 4

20. The value of sin 26° − cos 64° is:

A. 0

B. 1

C. 38

D. 90

21) The zero of the polynomial 3x + 7 is:

A. $\frac{-7}{3}$

B. $\frac{-3}{7}$

C. $\frac{3}{7}$

D. $\frac{7}{3}$

22) The simplified form of $[\frac{-1}{27}]^{\frac{-2}{3}}$ is:

A. -9

B. $\frac{-1}{9}$

C. $\frac{1}{9}$

D. 9

23) If x^{51}+51 is divided by x+1, then the remainder is:

A. 0

B. 1

C. 49

D. 50

24)The simplified form of $\frac{1}{\sqrt{9}-\sqrt{8}}$ is:

A. $\frac{1}{3+2\sqrt{2}}$

B. $\frac{3}{2}-\sqrt{2}$

C. $3-2\sqrt{2}$

D. $3+2\sqrt{2}$

25) If $\frac{a}{b}+\frac{b}{a}=-1$ where a, b $\neq 0$, then the value of a^3-b^3 is :

A. -3

B. -2

C. -1

D. 0

26) If $x-2$ is a factor of $x^2+3ax-2a$, then the value of a is:

A. -2

B. -1

C. 1

D. 2

27) If $(x+1)$ is a factor of $ax^4+bx^3+cx^2+dx+e$ then :

A. a + c+ e = b + d

B. a + b + e = c + d

C. a+ b + c = d + e

D. b + c + d = a + e

28) If x = 2 and y = -1 is a solution of the equation 2x + 3y = k then the value of k is:

A. 1

B. 5

C. 6

D. 7

29) The present age of A is 3 years more than thrice the present age of B. If the present ages of A and B are 'x ' and 'y' years respectively ,then the algebraic equation representing the given situation is:

A. x + 3 = 3y

B. $x-3=3y$

C. x + 3y + 3 = 0

D. x− 3 + 3y = 0

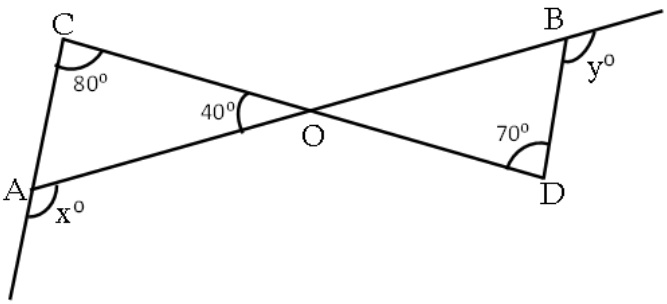
30) In the given figure, line segments CD and AB intersect at O. If ∠ACO=80°, ∠BDO=70° and ∠COA=40°, then the value of x + y is:

A. 190°

B. 210°

C. 230°

D. 270°



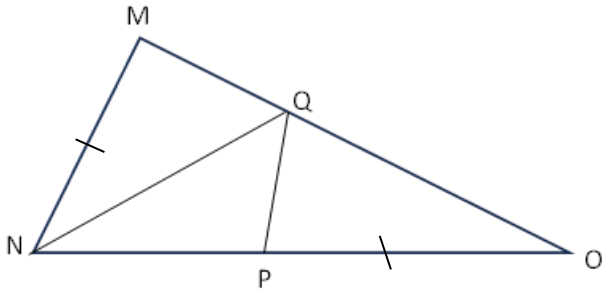
31. In the given figure, ∠MNO = 2∠NOM, NQ is the bisector of ∠MNO and MN=PO. Therefore, ΔMNQ is congruent to:

A. ΔQPO

B. ΔPOQ

C. ΔOQP

D. ΔNQP



32. The value of $sin^2 70^\circ + sin^2 20^\circ - 2cos^2 90^\circ$ is:

A. -3

B. -1

C. 0

D. 1

33. If Sin 2A = Cos (A-45^o)Where 2A is an acute angle, then the value of A:

A. 0°

B. 30°

C. 45°

D. 60°

34. ABC is a right triangle, right angled at B. If AB = 10cm and $\angle$ C = 30°, then the length side BC is:

A. 5 cm

B. $10\sqrt{3}$cm

C. 20 cm

D. $20\sqrt{3}$cm

35. If one angle of a triangle is equal to the sum of the other two angles then, the triangle is

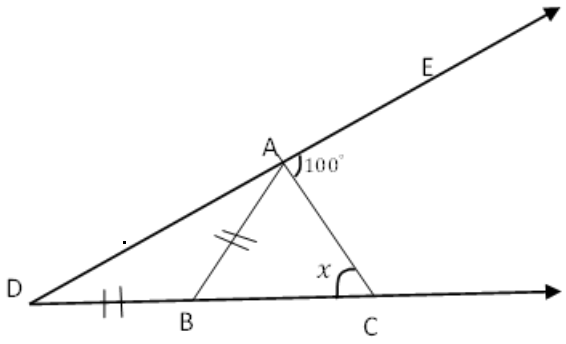
A. an acute triangle

B. an obtuse triangle

C. a right angled triangle

D. an equilateral triangle

36. In the given figure, AB divides $\angle$DAC such that the measure of $\angle$ CAB is thrice the measure of $\angle$ DAB. If AB = DB and $\angle$ EAC = 100°, then the value of x is:



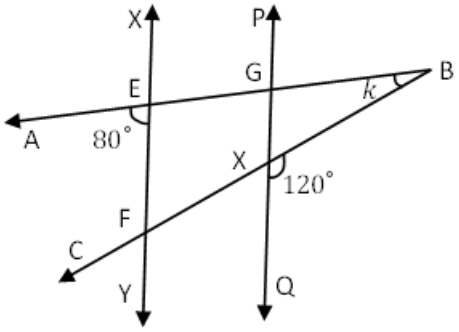
A. 40°

B. 60°

C. 80°

D. 100°

37. In the given figure , XY ‖ PQ
If $\angle$ AEF = 80° and $\angle$ BXQ = 120°, then the value of k is:



A. 20°

B. 30°

C. 40°

D. 100°

38. If the angles of a quadrilateral taken in order are in the ratio 3:7:6:4, then the quadrilateral is a:

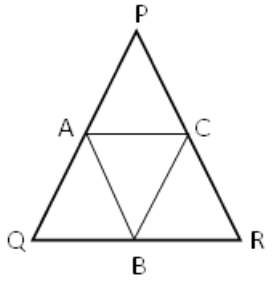
A. rhombus

B. parallelogram

C. trapezium

D. kite

39. In the given figure, points A, B and C are the mid-points of sides PQ, QR and PR of ΔPQR respectively. If the perimeter of ΔPQR is 4 cm, then the perimeter of ΔABC is:



A. 1 cm

B. 2 cm

C. 3 cm

D. 4 cm

40. REST is a rhombus . If $\angle RTE$ = $(3x - 2)°$ and $\angle TE$S= $(50-x)°$, then the measure of $\angle R$ is

A. 13°

B. 37°

C. 74°

D. 106°

Section B (2 marks each)

41. Represent $\sqrt{2}$ on number line.

42. Factorise the following quadratic polynomial by splitting the middle term.

$4x^2 - 11x + 6$

OR

$5x^2 + 12x - 9$

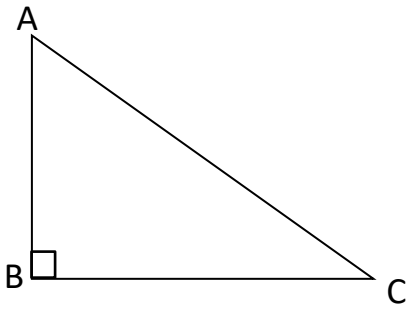
43. Factorise using a suitable identity: $27a^3 - 64b^3$.

44. Expand using a suitable identity: $(3x + 5y + 8z)^2$

OR

Evaluate using a suitable identity: $(103)^3$

45. In ΔABC , $\angle B = 90^0$, AB = 5 cm and BC = 12 cm
Find the length of AC and the value of Cos C.

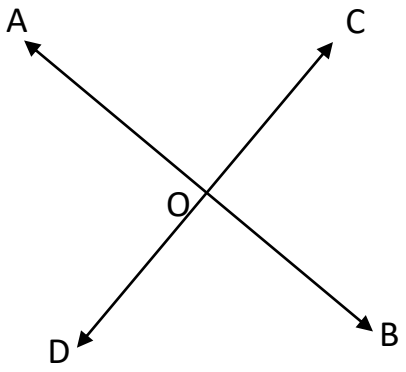


OR

Evaluate the following trigonometric expression using known trigonometric values of specific angles:

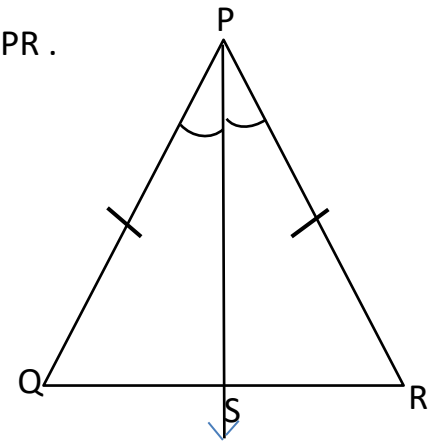
$$5 \tan^2 30^0 + 3 \sin^2 45^0$$

46. Given : In the adjoining figure ,
lines AB and CD intersect at 'O'
Prove that: $\angle AOC = \angle BOD$



47. Given : ΔPQR is an Isosceles triangle such that PQ = PR .
Ray PS is the bisector of $\angle QPR$

Prove that : $\angle Q = \angle R$



Section C (3 marks each)

48. Draw the graph of the following linear equation in two variables.

$2x + y = 9$

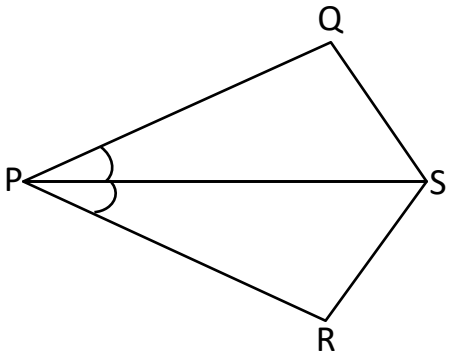
x			
Y			

(plot at least three points)

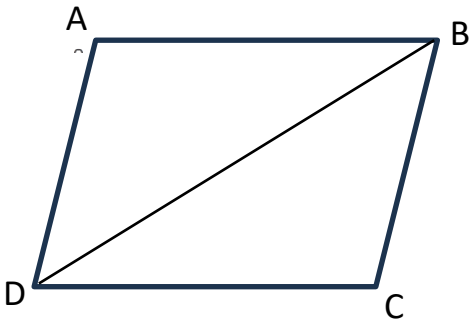
49. In the given figure, PQSR is a quadrilateral

In which $\angle Q = \angle R$ and PS bisects $\angle QPR$

Prove that : $\Delta PQS \cong \Delta PRS$.

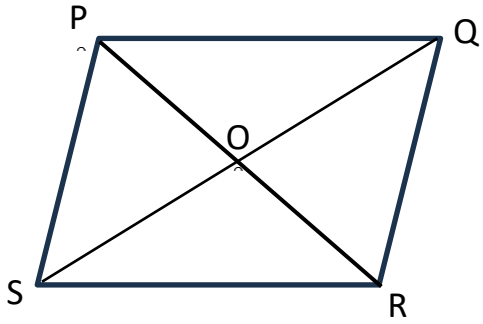


50. Given: □ABCD is a parallelogram.BD is the diagonal
Prove that: AB=CD and AD=BC

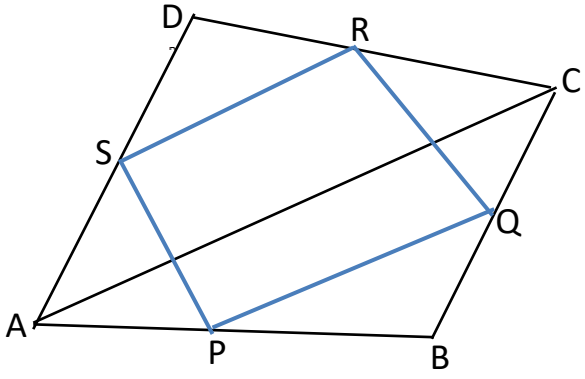


OR

Given that: In □PQRS , diagonals PR and QS intersect at O.
PO=OR and QO=SO
Prove that: □PQRS is a parallelogram.



51. Given: ABCD is a quadrilateral in which
P, Q, R and S are the mid-points of the sides AB, BC, CD and DA.
AC is the diagonal.
If SR= 5.2cm and QR=6.4cm,then
Find the length of AC, PQ and PS



52. Construct Δ ABC such that BC = 7.5 cm , B = $\angle 75^0$ and AB + AC = 13 cm.

OR

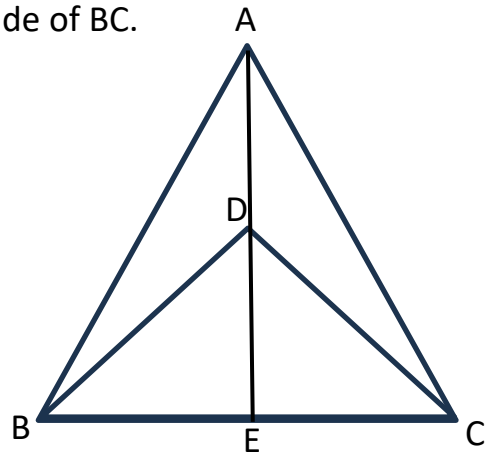
Construct Δ PQR such that QR = 6.5 cm , $\angle$ Q = 60^0 and PR -- PQ = 3. 5 cm.

53. Factorise the polynomial : $a^3 + 13a^2 + 32a + 20$

Section D (4 marks each)

54. Given : Δ ABC and Δ DBC are two isosceles triangles on the same base BC and the vertices A and D are on the same side of BC. AD is extended to intersect BC at E.

Prove that : Δ ABE $\cong$ Δ ACE .



55. Construct Δ PQR such that , $\angle$ Q = 45^0 , $\angle$ R = 60^0 and PQ + QR + PR = 11 cm. Measure and state the length of PQ, QR and PS.

----------X----------X----------