

**Mizoram Board
Class IX
Mathematics
Sample Paper – 1**

Time: 3 hrs

Total Marks: 80

General Instructions:

1. The question paper consists of 44 questions.
2. All questions are compulsory.
3. Internal choices have been provided in some questions.
4. Marks allocated to every question are indicated against it.

**Section A
(Questions 1 to 24 carry 1 mark each)**

Choose the correct answer from the given alternatives:

1. Which of the following is irrational?

- i. $(2 - \sqrt{5}) + (3 + \sqrt{5})$
- ii. $3(2 + \sqrt{5}) - 3\sqrt{5}$
- iii. $\pi - 10$
- iv. $\sqrt{\sqrt{16}}$

2. Find the value of p such that $(x - 1)$ is the factor of the polynomial $x^3 + 10x^2 + px$.

- i. $p = 7$
- ii. $p = -7$
- iii. $p = -11$
- iv. $p = 11$

3. In $\triangle ABC$ and $\triangle DEF$, $AB = DF$ and $\angle A = \angle D$. The two triangles will be congruent by AS axiom if one of the following expressions is true:

- i. $BC = EF$
- ii. $AC = DE$
- iii. $BC = DE$
- iv. $AC = EF$

4. An inconsistent system of two linear equations in two variables will have
- one solution
 - two solutions
 - no solution
 - more than two solutions
5. The range of the data set, 70, 65, 75, 71, 36, 55, 61, 62, 41, 40, 39, 35, is
- 35
 - 38
 - 40
 - 39
6. In a parallelogram PQRS, the sum of angles $\angle R$ and $\angle S$ is
- 90°
 - 180°
 - 240°
 - 360°
7. The range of the data set, 70, 65, 75, 71, 36, 55, 61, 62, 41, 40, 39, 35, is
- 35
 - 38
 - 40
 - 39
8. In a parallelogram PQRS, the sum of angles $\angle R$ and $\angle S$ is
- 90°
 - 180°
 - 240°
 - 360°
9. AB and CD are two parallel chords of a circle of radius 10 cm which lie on the same side of centre O. If AB = 16 cm and CD = 12 cm. Find the distance between the chords.
- 3cm
 - 4cm
 - 2cm
 - 5cm

10. An inconsistent system of two linear equations in two variables will have

- i. one solution
- ii. two solutions
- iii. no solution
- iv. more than two solutions

11. An irrational number between $\frac{5}{7}$ and $\frac{7}{9}$ is:

- i. 0.75
- ii. 0.750750075000...
- iii. 0.70
- iv. 0.7512

12. What is the remainder when $q(x) = 2x^3 - x^2 + x - 1$ is divided by $x + 2$?

- i. 20
- ii. -23
- iii. 35
- iv. -32

13. The distance of a point (2, 3) from the y- axis is

- i. 2 units
- ii. 1 unit
- iii. 5 units
- iv. 3 units

14. Which of the following is the solution of linear equation $\frac{1}{2}x = \frac{3}{2}y - 8$?

- i. (-1, -5)
- ii. (-1, 5)
- iii. (1, -5)
- iv. (1, 5)

15. How many equilateral triangles can be drawn on a given line segment?

- i. 1
- ii. 2
- iii. 3
- iv. None of these

16. The angle whose complement is one-third of its supplement will be

- i. 90°
- ii. 135°
- iii. 180°
- iv. 45°

- 17.** Sum of the angles of a quadrilateral is
- 180°
 - 540°
 - 360°
 - 90°
- 18.** The area of a parallelogram whose base is 4 cm and the height is 5 cm is
- 20cm
 - 20cm^2
 - 30cm
 - 30cm^2
- 19.** If the sum of a pair of opposite angles of a quadrilateral is 180° , the quadrilateral is:
- cyclic
 - parallelogram
 - square
 - rhombus
- 20.** The construction of a triangle ABC, given that $BC = 6$ cm, $\angle B = 45^\circ$ is not possible when difference of AB and AC is equal to :
- 6.9cm
 - 5.2cm
 - 5.0cm
 - 4.0cm
- 21.** A square sheet whose perimeter is 32 cm is painted at the rate of Rs. 5 per m^2 . The cost of painting is:
- Rs 320
 - Rs 340
 - Rs 350
 - Rs 160
- 22.** Class marks of a frequency distribution are 6, 10, 14, 18, 22, 26, and 30. Its class size will be
- 24
 - 16
 - 4
 - 10

- 23.** In an experiment, 100 drawing pins were dropped on a floor. 73 landed point up and the rest landed point down. A pin is selected at random and dropped. What is the probability that the pin will land point down?
- i. 0.73
 - ii. 0.27
 - iii. 0.37
 - iv. 0.72
- 24.** A data is such that its minimum value is 86 and range is 32, then the maximum value is
- i. 54
 - ii. 811
 - iii. 118
 - iv. 181

Section B
(Questions 25 to 34 carry 2 marks each)

25. Simplify:

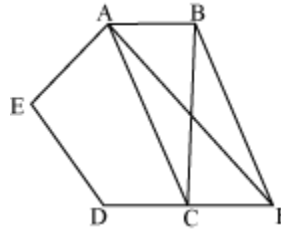
$$\left(\frac{81}{16}\right)^{-3/4} \times \left(\frac{25}{9}\right)^{-3/2}$$

26. Factorise: $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$

27. Where do the following points lie:

- (-4,0)
- (-10,2)
- (0,8)
- (10,4)

28. In the given figure, ABCDE is a pentagon. A line through B and parallel to AC meets DC produced at F. Show that area (ΔACB) = area (ΔACF).

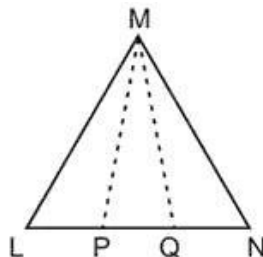


29. A rectangular metallic sheet has dimensions 48 cm x 36 cm. From each corner a square of 8 cm is cut off. An open box is made of the remaining sheet. Find the volume of the box.

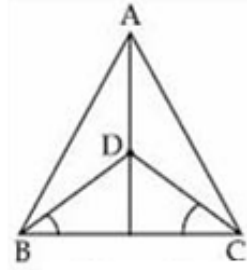
30. Simplify: $\frac{(25)^2 \times (343)^3}{16^5 \times 8^4 \times 7^3}$

31. $(x + 2)$ is one of the factors of the polynomial $x^3 + 13x^2 + 32x + 20$. Find its remaining factors.

32. In the figure, it is given that $LM = MN$ and $LP = QN$. Prove that $\Delta LMQ \cong \Delta NMP$



- 33.** The polynomials $p(x) = ax^3 + 3x^2 - 3$ and $q(x) = 2x^3 - 5x + a$ when divided by $(x - 4)$ leave the remainders R_1 and R_2 . Find 'a' if $R_1 + R_2 = 0$. Factorise the polynomial
- 34.** In figure, $AB = AC$, D is the point in the interior of $\triangle ABC$ such that $\angle DBC = \angle DCB$. Prove that AD bisects $\angle BAC$ of $\triangle ABC$.



Section C
(Questions 35 to 41 carry 3 marks each)

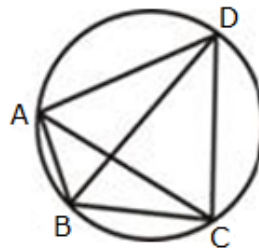
- 35.** A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is a
- queen
 - non-ace card
 - black card

Or

Three coins are tossed simultaneously 200 times with different outcomes having the following frequencies:

Outcome	3 h e a d s	2 h e a d s	1 h e a d	No h e a d
Frequency	23	72	77	28

- 36.** Show that the line segments joining the mid points of the opposite sides of a quadrilateral bisect each other.
- 37.** In the given figure, ABCD is a cyclic quadrilateral, in which AC and BD are the diagonals. If $m\angle DBC = 55^\circ$ and $m\angle BAC = 45^\circ$, find $m\angle BCD$.



- 38.** The diameter of a roller is 84 cm and its length is 120 cm. It takes 500 complete revolutions to move over once to level a playground. Find the area of the playground in m^2 ? $\left[\pi = \frac{22}{7} \right]$

- 39.** The following observations have been arranged in the ascending order. 29, 32, 48, 50, x , $x + 2$, 72, 78, 84, 95
If the median of the data is 63, find the value of x .

Or

Neha and Richa, two students of class IX of a school, together contributed Rs. 100 towards the Prime Minister's Relief Fund, to help earthquake victims. Assume Neha's contribution to be x and that of Richa to be y . Write a linear equation which this data satisfies and draw a graph of the same.

- 40.** Find the value of:

$$\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2}$$

- 41.** How does Euclid's fifth postulate imply the existence of parallel lines? Give a mathematical proof.

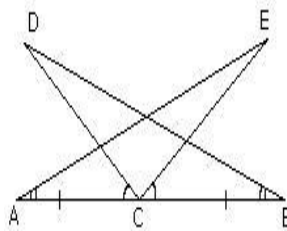
Section D

(Questions 42 to 44 carry 5 marks each)

- 42.** Simplify:

$$\frac{(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3}{(a - b)^3 + (b - c)^3 + (c - a)^3}$$

- 43.** In the figure, if $AC = BC$, $\angle DCA = \angle ECB$ and $\angle DBC = \angle EAC$, then prove that $BD = AE$.



Or

If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal.

- 44.** The volume of a cylinder is 6358 cu. cm and its height is 28 cm. Find its radius and the curved surface area.

Or

Hamid built a cubical water tank lid for his house, with each outer edge 1.5 m long. He gets the outer surface area of the tank excluding the base covered with square tiles of sides 25 cm. How much will he spend on the tiles, if the cost of the tiles is Rs. 360 per dozen?