

Sahiwal Board 2021

Class 9th

Mathematics

Group - I

- $\frac{a^2-b^2}{a+b}$ is equal to:
 - $(a - b)^2$
 - $(a + b)^2$
 - $(a + b)$
 - $(a - b)$
- $\log_y x$ will be equal to:
 - $\frac{\log_y x}{\log_y z}$
 - $\frac{\log_x z}{\log_y z}$
 - $\frac{\log_y x}{\log_z y}$
 - $\frac{\log_x y}{\log_z x}$
- $\log_b a \times \log_z b$ can be written as:
 - $\log_z c$
 - $\log_c a$
 - $\log_z b$
 - $\log_b c$
- Which is order of a square matrix?
 - 2 - by - 2
 - 1 - by - 2
 - 2 - by - 1
 - 3 - by - 2
- The value of i^9 is:
 - 1
 - 1

- C. i
- D. $-i$
6. Every real number is a:
- A. positive integer
- B. rational number
- C. negative integer
- D. complex number
7. The order of matrix $\begin{Bmatrix} 2 & 1 \end{Bmatrix}$ is:
- A. 2 - by - 1
- B. 1 - by - 2
- C. 1 - by - 1
- D. 2 - by - 2
8. The medians of a triangle cut each other in the ratio:
- A. 4 : 1
- B. 3 : 1
- C. 2 : 1
- D. 1 : 1
9. A point equidistant from the end points:
- A. bisector
- B. right bisector
- C. perpendicular
- D. median
10. If $y=2x+1$, $x=2$ then y is:
- A. 2
- B. 3
- C. 4
- D. 5
11. Distance between the points $(1, 0)$ and $(0, 1)$ is:
- A. 0

B. 1

C. $\sqrt{2}$

D. 2

12. L.C.M of $a^2 + b^2$ and $a^4 - b^4$ is:

A. $a^2 + b^2$

B. $a^2 - b^2$

C. $a^4 - b^4$

D. $a - b$

13. Which of the given is the solution of the inequality $3 - 4x \leq 11$?

A. -8

B. -2

C. $-\frac{14}{4}$

D. none of these

14. H.C.F of $x - 2$ and $x^2 + x - 6$ is:

A. $x^2 + x - 6$

B. $x + 3$

C. $x - 2$

D. $x + 2$

15. Factors of $8x^3 + 27y^3$ are:

A. $(2x + 3y), (4x^2 + 9y^2)$

B. $(2x - 3y), (4x^2 - 9y^2)$

C. $(2x + 3y), (4x^2 - 6xy + 9y^2)$

D. $(2x - 3y), (4x^2 + 6xy + 9y^2)$

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Section - I

2. Attempt any six parts.

12=2x6

(i) Find the transpose of matrix. $B = \begin{bmatrix} 5 & 1 & -6 \end{bmatrix}$

(ii) Find the determinant of matrix. $B = \begin{bmatrix} 1 & 3 \\ 2 & -2 \end{bmatrix}$

(iii) Express as rational number. $0.\overline{13}$

(iv) Evaluate: $(-i)^8$

(v) Find the value of x. $\log_3 x = 4$

(vi) Write the sum or difference. $\log \frac{(22)^{1/3}}{5^3}$

(vii) Simplify. $2(6\sqrt{5} - 3\sqrt{5})$

(viii) Rationalize the denominator. $\frac{2}{\sqrt{5}-\sqrt{3}}$

(ix) Factorize. $3x^3y(x - 3y) - 7x^2y^2(x - 3y)$

3. Attempt any six parts.

12=2x6

(i) Find the H.C.F of the expression $x^2 + 5x + 6$ and $x^2 - 4x - 12$ by factorization.

(ii) Solve the equation. $\sqrt{\frac{x+1}{2x+5}} = 2, x \neq -\frac{5}{2}$

(iii) Find the value of x. $|x + 2| - 3 = 5 - |x + 2|$

(iv) Find the values of m and c of the given line $3x + y - 1 = 0$ by expressing it in the form $y = mx + c$.

(v) Verify that the given point $(0, 0)$ lies on the line $2x - y + 1 = 0$ or not?

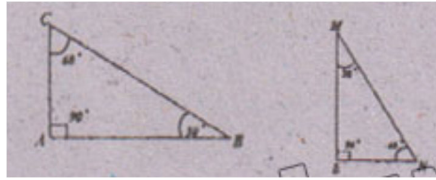
(vi) Find the distance between pair of points: $A(0, 0), B(0, -5)$

(vii) Find the midpoint between pair of points: $A(6, 6), B(4, -2)$

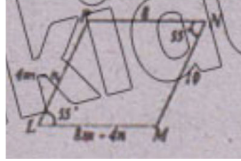
(viii) In $\triangle ABC \cong \triangle LMN$, then:

(i) $m\angle M \cong$ _____

(ii) $m\angle N \cong$ _____



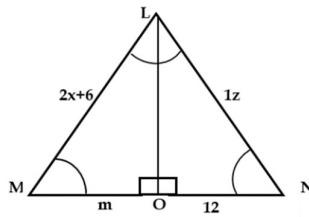
(ix) The given figure LMNP is a parallelogram. Find m and n.



4. Attempt any six parts.

12=2x6

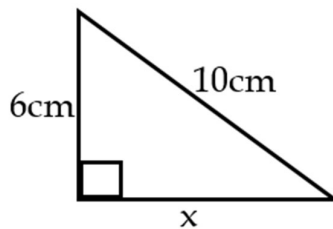
(i) In the give congruent triangles LMO and LNO, find the unknowns x and m.



(ii) If 13cm, 12cm, 5cm are the lengths of a triangle, then verify that difference of measures of two sides of a triangle is less than the measures of the third side.

(iii) Define Proportion.

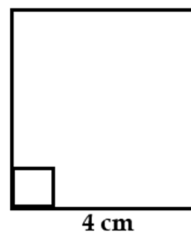
(iv) Find the unknown value in the given figure:



(v) Verify that the triangle having the give measures of sides is a right angled triangle. $a=16\text{cm}$, $b=30\text{cm}$, $c=34\text{cm}$.

(vi) Define Rectangular Region.

(vii) Find the area of a given figure:



(viii) Define Circumcentre.

(ix) Construct a ΔABC , in which: $m\overline{AB} = 3cm, m\overline{AC} = 3.2cm, m\angle A = 45^\circ$

Section - II

NOTE: Attempt any three questions. Question No.9 is compulsory. 24=8x3

5. (A) Use Cramer's rule to solve the linear equation if possible:

$$\begin{aligned}4x + 2y &= 8 \\3x - y &= -1\end{aligned}$$

(B) Simplify: $\sqrt{\frac{(216)^{2/3} \times (25)^{1/2}}{(0.04)^{-1/2}}}$

6. (A) Use log table to solve it: $\frac{(8.97)^3 \times (3.95)^2}{\sqrt[3]{15.37}}$

(B) If $= \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$, then find the values of $x + \frac{1}{x}$ and $x^2 + \frac{1}{x^2}$.

7. (A) Factorize $x^2 + 14x + 48$

(B) Simplify $\frac{x^2-x-6}{x^2-9} + \frac{x^2+2x-24}{x^2-x-12}$

8. (A) Solve $\frac{5(x-3)}{6} - x = 1 - \frac{x}{9}$

(B) Construct ΔPQR and draw its altitude from the given data:

$$mRP = 3.6cm, m\angle Q = 30^\circ, m\angle P = 105^\circ$$

9. Prove that any point on the right bisector of a line segment is equidistant from its end points.

OR

Prove that Any point on the bisector of an angle is equidistant from its arms.

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Group - II

1. The logarithm of unity to any base is:

- (A) 1
- (B) 10
- (C) 0
- (D) 0

2. What will be added to complete the square of $9a^2 - 12ab$?

- (A) $-16a^2$
- (B) $16b^2$
- (C) $4b^2$
- (D) $-4b^2$

3. Points (2, -3) lies in quadrant:

- (A) I
- (B) II
- (C) III
- (D) IV

4. The medians of a triangle cut each other in the ratio:

- (A) 4:1
- (B) 3:1
- (C) 2:1
- (D) 1:1

5. L.C.M of $15x^2$, $45xy$, $30xyz$ is:

- (A) $90xyz$
- (B) $90x^2yz$
- (C) $15xyz$
- (D) $15x^2yz$

6. Mid-point of the points (2,2) and (0:0) is:

- (A) (1,1)
- (B) (1,0)
- (C) (0,1)
- (D) (-1, -1)

7. If the capacity “c” of an elevator is at most 1600 pounds, then:

- (A) $c < 1600$
- (B) $c \geq 1600$
- (C) $c \leq 1600$
- (D) $c > 1600$

8. A quadrilateral having each angle equal to 90° is called:

- (A) Parallelogram
- (B) Rectangle
- (C) Trapezium
- (D) Rhombus

9. The product of two algebraic expressions is equal to the _____ of their H.C.F and L.C.M

- (A) sum
- (B) difference
- (C) quotient
- (D) product

10. Which is order of square matrix?

- (A) 2 – by -2
- (B) 1– by -2
- (C) 2 – by -1
- (D) 3 – by -2

11. $\frac{a^2 - b^2}{a + b}$ is equal to:

- (A) $(a - b)^2$
- (B) $(a + b)^2$
- (C) $a + b$
- (D) $a - b$

12. $\begin{bmatrix} \sqrt{2} & 0 \\ 0 & \sqrt{2} \end{bmatrix}$ is called _____ matrix.

- (A) zero
- (B) scalar
- (C) unit
- (D) singular

13. $\log_b a \times \log_c b$ can be written as:

- (A) $\log_a c$
- (B) $\log_c a$
- (C) $\log_a b$
- (D) $\log_b c$

14. Real part of $2ab(i + i^2)$ is:

- (A) $2ab$
- (B) $-2ab$
- (C) $2abi$
- (D) $-2abi$

15. Which of the given sets have the closure property w.r.t addition?

- (A) $\{0\}$
- (B) $\{0, -1\}$
- (C) $\{0, 1\}$
- (D) $\left\{1, \sqrt{2}, \frac{1}{2}\right\}$

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Mathematics

Group - II

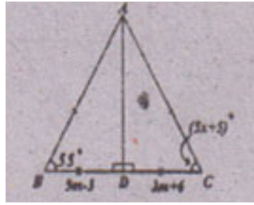
Section - I

2. Write short answers any six parts. 6x2=12

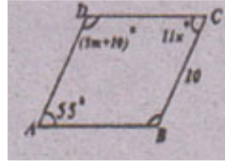
- i. Verify that if $B = \begin{bmatrix} 1 & 1 \\ 2 & 0 \end{bmatrix}$, then $(B^t)^t = B$.
- ii. Find the multiplicative invers (if it exist) $D = \begin{bmatrix} \frac{1}{2} & \frac{3}{4} \\ 1 & 2 \end{bmatrix}$
- iii. Simplify: $\sqrt{25x^{10n}y^{5n}}$
- iv. Express the recurring decimal $0.\overline{67}$ as the rational number $\frac{p}{q}$ where p,q are integer and $q \neq 0$.
- v. Express in ordinary notation. 5.06×10^{10}
- vi. Find the value of x. $\log_x 64 = 2$
- vii. Simplify. $(x^2 - 49) \cdot \frac{5x+2}{x+7}$
- viii. Express in the simplest form. $\sqrt[3]{96x^6y^7z^3}$
- ix. Use the remainder through to find the remainder when $x^3 - 3x^2 + 4x - 14$ is divided by $(x + 2)$.

3. Write short answers any six parts. 6x2=12

- i. Using factorization to find square root of: $4x^2 - 12xy + 9y^2$
- ii. Solve the equation. $\sqrt[2]{2x+3} = \sqrt[3]{x-2}$
- iii. Find the value of x: $\left| \frac{x+5}{2-x} \right| = 6$
- iv. Write $x - 2y = -2$ in the form $y = mx + c$.
- v. Draw the graph of $y = 3x$.
- vi. Find the mid-points between pair of points. $A(-4, 9), B(-4, -3)$
- vii. Find the distance between the pair of points. $A(0, 0), B(0, -5)$
- viii. Find the values of unknown x and m for the given congruent triangles.

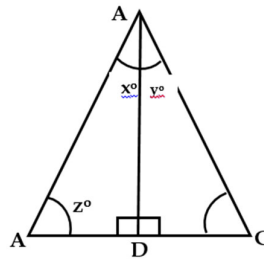


ix. If ABCD is a parallelogram, find x and m .



4. Write short answers any six parts. $6 \times 2 = 12$

i. If the given triangle ABC is equilateral triangle and \overline{AD} is bisector of an angle A, then find the values of unknown x° , y° and z° .



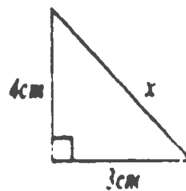
ii. 3cm, 4cm and 7cm are not the lengths of the triangle. Give the reason.

iii. Define Similar Triangles.

iv. Verify that the Δ having the measure of sides is a right-angled triangle.

$$a=5\text{cm}, b=12\text{cm}, c=13\text{cm}$$

v. Find the unknown value of x in the figure.



vi. Define Altitude or Height of a triangle.

vii. Find the area of the figure.



viii. Construct a ΔABC , in which: $m\overline{AB} = 3\text{cm}, m\overline{AC} = 3.2\text{cm}, m\angle A = 45^\circ$

- ix. Define point of concurrency.

Section - II

Attempt any three questions. Each question carries Eight marks but question No. 9 is compulsory. (4+4=8)

5. (A) Solve by the matrix inversion method.
$$\begin{aligned} 2x - 2y &= 4 \\ 3x + 2y &= 6 \end{aligned}$$
- (B) Simplify $\left(\frac{32x^{-6}y^{-4}z}{625x^4yz^{-4}}\right)^{2/3}$
6. (A) Use the table to find the value of: 0.8176×13.64
- (B) If $m+n+p=10$ and $nm+mp=27$ then find the value of $m^2 + n^2 + p^2$.
7. (A) Factorize. $8x^3 + 60x^2 + 150x + 125$
- (B) Find square root. $\left[x + \frac{1}{x}\right]^2 - 4\left[x - \frac{1}{x}\right], (x \neq 0)$
8. (A) Solve the equation. $\frac{1}{x^2-1} - \frac{1}{x+1} = \frac{1}{x+1}, x \neq 1$
- (B) Construct ΔXYZ and draw its medians.

$$m\overline{XY} = 4.5cm, m\overline{YZ} = 3.4cm, m\overline{ZX} = 5.6cm$$

9. Prove that any point on the bisector of an angle is equidistant from its arms.

OR

Prove that any point on the right bisector of a line segment is equidistant from its end points.