

# Lahore Board 2021

## Class 9<sup>th</sup>

### Math

#### Group - I

1. 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
2. Adj of  $\begin{bmatrix} 1 & 2 \\ 0 & -1 \end{bmatrix}$  is:
  - a.  $\begin{bmatrix} 1 & 2 \\ 0 & -1 \end{bmatrix}$
  - b.  $\begin{bmatrix} -1 & 2 \\ 0 & -1 \end{bmatrix}$
  - c.  $\begin{bmatrix} -1 & 2 \\ 0 & 1 \end{bmatrix}$
  - d.  $\begin{bmatrix} -1 & -2 \\ 0 & 1 \end{bmatrix}$
3. In  ${}^3\sqrt{35}$  the radicand is:
  - a. 3
  - b.  $\frac{1}{3}$
  - c. 35
  - d.  $\sqrt{35}$
4. Imaginary part of  $-i(3i+2)$  is \_\_\_\_\_:

- a. -2
  - b. 2
  - c. 3
  - d. -3
5. If  $a^x=n$ , then:
- a.  $a=\log_x n$
  - b.  $X=\log_n a$
  - c.  $X=\log_a n$
  - d.  $a=\log_n x$
6. The value of  $\log \frac{P}{q}$  is:
- a.  $\log P-\log q$
  - b.  $\frac{\log P}{\log q}$
  - c.  $\log p + \log q$
  - d.  $\log q - \log p$
7.  $(3 + \sqrt{2})(3 - \sqrt{2})$  is equal to:
- a. 7
  - b. -7
  - c. -1
  - d. 1
8. Factors of  $3x^2 - x - 2$  are
- a.  $(x + 1)(3x - 2)$
  - b.  $(x + 1)(3x + 2)$
  - c.  $(x - 1)(3x - 2)$

- d.  $(x - 1)(3x + 3)$
9. The square root of  $a^2 - 2a + 1$  is:
- a.  $\pm(a+1)$
  - b.  $\pm(a-1)$
  - c.  $(a-1)$
  - d.  $(a+1)$
10. L.C.M. of  $a^2 + b^2$  and  $a^4 - b^4$  is:
- a.  $a^2 + b^2$
  - b.  $a^2 - b$
  - c.  $a^4 - b^4$
  - d.  $a - b$
11.  $x = 0$  is a solution of the inequality.....:
- a.  $x > 0$
  - b.  $3x + 5 < 0$
  - c.  $x + 2 < 0$
  - d.  $x - 2 < 0$
12. If  $(x, 0) = (0, y)$ , then  $(x, y)$  is:
- a.  $(0,1)$
  - b.  $(1,0)$
  - c.  $(0,0)$
  - d.  $(1,1)$
13. Mid - point of the points  $(2, -2)$  and  $(-2,2)$  is :
- a.  $(2,2)$
  - b.  $(-2, -2)$
  - c.  $(0,0)$
  - d.  $(1,1)$
14. .... congruent triangles can be made by joining the mid. points of the sides of a triangle:
- a. Three

b. Four

c. Five

d. Two

15. The diagonal of parallelogram \_\_\_ each other.

a. Bisect

b. Trisect

c. Bisect at right angle

d. Trisect at right angle

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Math

Group - I

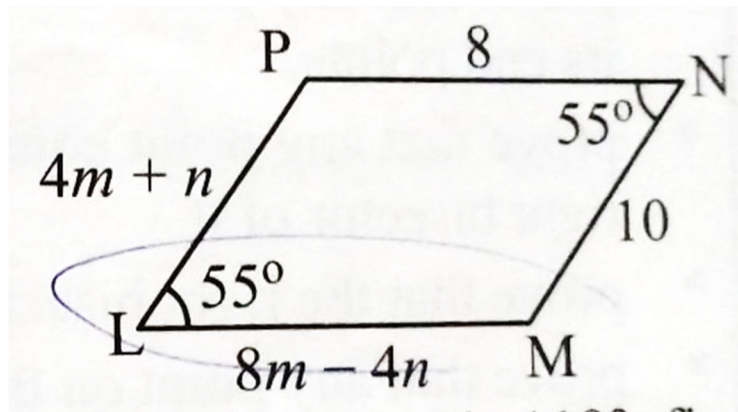
**Q # 2: Write short answers to any SIX(6) questions:**

- i. If  $B = A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$  then verify that  $(B')' = B$
- ii.  $[a + 3 \quad 4] = [-3 \quad 4]$
- iii.  $[6 \quad b.1][6 \quad 2]^{\text{then}}$  find  $a, b$
- iv. Simplify.  $1^{50}$
- v. Find the value of  $x \log_{62x} 5 = \frac{1}{4}x$
- vi. Express the given number in scientific notation; 446.9 (0)
- vii. Simplify the given expression  $\frac{(x+y)^2 - 4xy}{(x-y)}$
- viii. Simplify  $\sqrt{21} \times \sqrt{7} \times \sqrt{3}$
- ix. Factorize  $4x^2 - 16y^2$

**Q # 3: Write short answers to any SIX (6) questions:**

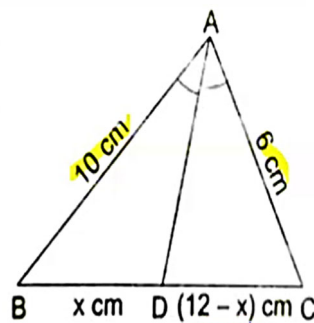
- i. Find H.C.F:  $102xy^2z, 85x^2yz, 187xyz^2$
- ii. Solve the equation:  $\sqrt{\frac{x+1}{2x+5}} = 2, x \neq -\frac{5}{2}$
- iii. Solve for  $x |2x + 5| = 11$
- iv. Writing in the form of  $y = mx + c$  find the value of  $m$  and  $c$  :  
 $x - 2y = -2$

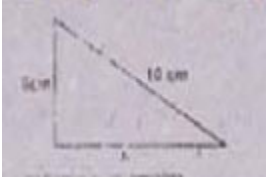

- v. Verify whether the point  $(2,3)$  lies on the line  $2x - y + 1 = 0$  or not,
- vi. Find the mid-point of the line segment joining the pair of points  $A(0,0)$  and  $B(0,-5)$
- vii. Find the distance between the pair of points :  $A(9,2), B(7,2)$
- viii. If  $ABC \cong LMN$  find the value of  $x$  :
- ix. If LMNP is a parallelogram find the values of  $m, n$  :



**Q # 4: Write short answers to any SIX (6) questions:**

- i. Define ratio.
- ii. In equilateral triangle  $ABC$ ,  $\overline{AD}$  is bisector of angle  $A$ , then find the value of  $x^\circ, y^\circ$  and  $z^\circ$  :



- iii. What will be the triangle for shortest distance from an outside point to the line?
- iv. Verify that the triangle having the following measures of the sides is right angled  $a = 5$  cm,  $b = 12$  cm and  $c = 13$  cm.
- v. Find the value of  $X$  in the figure: 
- vi. Find the area of figure 
- vii. Define area of the figure.
- viii. Construct  $\triangle ABC$  in which:  $m\angle A = 2.5^\circ$ ,  $m\angle B = 105^\circ$
- ix. Define circumcenter.

## Part -II

**Note: Attempt any two questions.**

- 5 (a) Solve the system of linear equations by Cramer's rule: 4

$$2x - 2y = 4$$

$$3x + 2y = 6$$

(b) Simplify:  $\left(\frac{a^p}{a^q}\right)^{p+q} \cdot \left(\frac{a^q}{a^r}\right)^{q+r} \div 5(a^p \cdot a^r)^{p+r}$ ,  $a \neq 0$  4

- 6 (a) Use log table to find the value of:  $\sqrt[3]{25.47}$  4

(b) If  $x + y + z = 12$  and  $x^2 + y^2 + z^2 = 64$  then find the value of  $xy + yz + zx$  4

7 (a) Factorize:  $x^2 - y^2 - 4xz + 4z^2$  4

(b) Find H.C.F by the division method: 4

$$x^3 + 3x^2 - 16x + 12, x^3 + x^2 - 10x + 8$$

8 (a) Solve the equation:  $\frac{5(x-3)}{6} - x = 1 - \frac{x}{9}$  4

(b) Construct the triangle ABG and draw the perpendicular

bisector of its sides.  $\overline{mBC} = 2.9\text{cm}, m\angle A = 30^\circ, m\angle B = 60^\circ$  4

9: (a) Prove that any point on the right bisector of a line segment is equidistant from its end points. 4

(b) Prove that any point on the bisector of an angle is equidistant from. 4



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**Math**

**Group - II**

1. Adj of  $\begin{bmatrix} 1 & 2 \\ 0 & -1 \end{bmatrix}$  is:

a.  $\begin{bmatrix} 1 & 2 \\ 0 & -1 \end{bmatrix}$

b.  $\begin{bmatrix} -1 & 2 \\ 0 & -1 \end{bmatrix}$

c.  $\begin{bmatrix} -1 & 0 \\ 2 & 1 \end{bmatrix}$

d.  $\begin{bmatrix} -1 & -2 \\ 0 & 1 \end{bmatrix}$

2. The product of  $[x \ y] \begin{bmatrix} 2 \\ -1 \end{bmatrix}$  is

a.  $[2x + y]$

b.  $[x - 2y]$

c.  $[2x - y]$

d.  $[x + 2y]$

3. Write  $4^{\frac{2}{3}}$  with radical sign:

a.  ${}^3\sqrt{4}$

b.  $\sqrt{4}$

c.  ${}^2\sqrt{4^3}$

d.  $\sqrt{4^6}$

4. In  $\sqrt[3]{35}$  the radicand is:

- a. 3
- b.  $\frac{1}{3}$
- c. 35
- d. None of these

5.  $\text{Log } e = \underline{\hspace{2cm}}$ , where ( $e \approx 2.718$ ):

- a. 0
- b. 0.4343
- c.  $\infty$
- d. 1

6. The value of  $\log\left(\frac{p}{q}\right)$  is:

- a.  $\log p - \log q$
- b.  $\frac{\log P}{\log q}$
- c.  $\log p + \log q$
- d.  $\log q - \log p$

7.  $a^3 + b^3 = \underline{\hspace{2cm}}$ :

- a.  $(a-b)(a^2 + ab + b^2)$
- b.  $(a+b)(a^2 - ab + b^2)$
- c.  $(a-b)(a^2 - ab + b^2)$
- d.  $(a-b)(a^2 + ab - b^2)$

8. Factors of  $4^2 - 4b^2$  are:

- a.  $(a-b)(a+b)(a^2 - 4b^2)$

b  $(a^2 - 2b^2)(a^2 + 2b^2)$

c  $(a - b)(a + b)(a^2 - 4b^2)$

d  $(a - 2b)(a^2 + 2b^2)$

**9. HCF of  $x^2 - 5x + 6$  and  $x^2 - x - 6$  is:**

a.  $x - 3$

b.  $x + 2$

c.  $x^2 - 4$

d.  $x - 2$

**10. H.C.F. of  $a^2 - b^2$  and  $a^3 - b^3$  is \_\_\_\_\_:**

a.  $a - b$

b.  $a + b$

c.  $a^2 + ab + b^2$

d.  $a^2 - ab + b^2$

**11. If  $x$  is no larger than 10, then \_\_\_\_\_:**

a.  $x \geq 8$

b.  $x \leq 10$

c.  $x < 10$

d.  $x > 10$

**12. Point  $(2, -3)$  lies in quadrant:**

a. I

b. II

c. III

d. IV

**13. Mid - point of the points  $(2, 2)$  and  $(0, 0)$  is :**

a.  $(1, 1)$

- b. (1,0)
- c. (0,1)
- d. (-1,-1)

**14. The right bisectors of the three sides of a triangle are\_\_\_\_\_:**

- a. Congruent
- b. Collinear
- c. Concurrent
- d. Parallel

**15. A point equidistant from the end points of a line segment is on its\_\_\_\_\_:**

- a. Bisector
- b. Right bisector
- c. Perpendicular
- d. Median

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Math

Group - II

**Q # 2: Write short answers to any SIX(6) questions:**

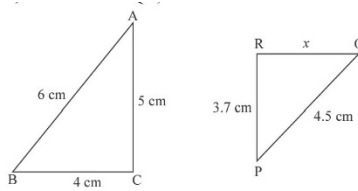
**12**

- i. Find the multiplicative inverse:  $A = \begin{bmatrix} -1 & 3 \\ 2 & 0 \end{bmatrix}$
- ii. Simplify:  $5^2 \div (5^2)^3$
- iii. Simplify:  $5\sqrt{\frac{3}{32}}$
- iv. Write the conjugate: -i
- v. Express in ordinary form:  $5.06 \times 10^{10}$
- vi. Find the value of x:  $\log_x 64 = 2$
- vii. Reduce to the lowest form:  $\frac{x^2 - 4x + 4}{2x^2 - 8}$
- viii. Simplify  $\sqrt{21} \times \sqrt{7} \times \sqrt{3}$
- ix. Factorize  $2xy^2(x^2 + 5) + 8xy^2(x^2 + 5)$

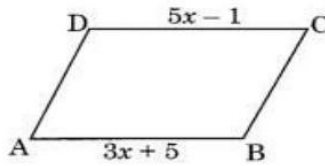
**Q # 3: Write short answers to any SIX (6) questions:**

- i. Use factorization to find the square root of:  $4x^2 - 12xy + 9y^2$
- ii. Solve the equation:  $\sqrt{3x+4} = 2$
- iii. Solve for x,  $\left| \frac{x+5}{2-x} \right| = 6$
- iv. Find the values of m and c of the line  $x-2y=-2$  by expressing it in the form  $y=mx+c$   $x-2y=-2$

- v. Verify whether the point (5,3) lies on the line  $2x-y+1=0$  or not.
- vi. Find the distance between pair of points A(7,5), B(1,2)
- vii. Find the mid-point between the pair of points: A(7,5), B (1,-1)
- viii. If  $\triangle ABC \cong \triangle LMN$ , then find the unknown  $x$ :

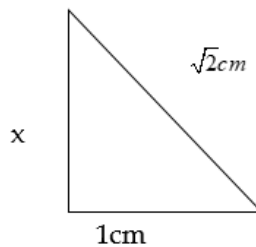


- ix. The given figure ABCD is a parallelogram, find  $x$  and  $m$

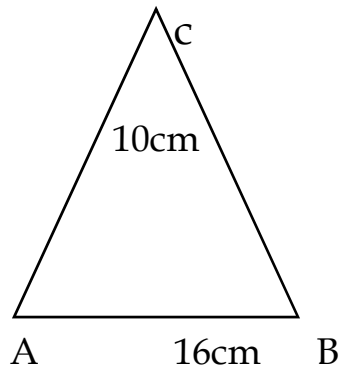


**Q # 4: Write short answers to any SIX (6) questions:**

- i. Define similar triangles.
- ii. Define ratio.
- iii. 3cm, 4cm and 7cm are not the lengths of the triangle, give reason.
- iv. Find the unknown vale in the given figure:



- v. Verify that the triangle having the measures of sides is a right triangle:  $a=16\text{cm}$ ,  $b=30$ ,  $c=34\text{cm}$
- vi. Define rectangular region.
- vii. Find the area of the given figure:



- viii. Define centroid.
- ix. Construct a  $\triangle ABC$  in which  $m\overline{AB} = 2.5\text{cm}$ ,  $m\angle 30^\circ$ ,  $m\angle V = 105^\circ$

### Part -II

**Note: Attempt any two questions.**

- 5 (a) Use matrices inverse method to solve the linear equations,  
 possible:  $2x - 2y = 4$ ,  $3x + 2y = 6$  4
- (b) find  $x$  and  $y$ :  $(2 - 3i)(x + yi) = 2(x - 2yi) + 2i - 1$  4
- 6 (a) Use log tables to find the value of :  $\frac{(1.23)(0.6972)}{(0.0075)(1278)}$  4
- (b) if  $q = \sqrt{5} + 2$  then find the value of  $q^2 + \frac{1}{q^2}$  4

7 (a) Factorize:  $4x^2 - 17xy + 4y^2$  4

(b) Simplify:  $\frac{x^2 - x - 6}{x^2 - 9} + \frac{x^2 + 2x - 24}{x^2 - x - 12}$  4

8 (a) Solve:  $\frac{2}{3x+6} = \frac{1}{6} - \frac{1}{2x+4}$   $x \neq -2$  4

(b) Construct the  $\triangle ABC$  Draw the perpendicular bisectors of I sides:

$\overline{AB} = 5.3\text{cm}, m\angle A = 45^\circ, m\angle B = 30^\circ$  4

9: (a) Prove that any point on the right bisector of a line segment equidistant from its end points. OR 4

(b) Any point on the bisector of an angle is equidistant from its arms. 4