

# Multan Board 2021

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

### Mathematics

#### Group - I

- Product of  $(x + y) \begin{bmatrix} 2 \\ -1 \end{bmatrix}$  is:
  - $[2x + y]$
  - $[2x - y]$
  - $[x - 2y]$
  - $[x + 2y]$
  
- If  $\begin{vmatrix} 2 & 6 \\ 3 & x \end{vmatrix} = 0$ , then 'x' is equal to:
  - 9
  - 6
  - 6
  - 9
  
- The conjugate of  $5 + 4i$  is:
  - $-5 + 4i$
  - $5 - 4i$
  - $-5 - 4i$
  - $5 + 4i$
  
- Real part of  $2ab(1 + i^2)$  is:
  - $-2ab$
  - $2abi$
  - $2ab$
  - $-2abi$

5. 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.  $\log q - \log p$

6.  $\log_y x$  will be equal to:

A.  $\frac{\log_z x}{\log_y z}$

B.  $\frac{\log_x z}{\log_y z}$

C.  $\frac{\log_z x}{\log_z y}$

D.  $\frac{\log_z y}{\log_z x}$

7. The degree of polynomial  $4x^2 + 2x^2y$  is:

A. 1

B. 2

C. 3

D. 4

8. Factors of  $3x^2 - x - 2$  are:

A.  $(x + 1), (3x - 2)$

B.  $(x - 1), (3x - 2)$

C.  $(x - 1), (3x - 2)$

D.  $(x - 1), (3x + 2)$

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

10. Simplify  $\frac{a}{9a^2-b^2} + \frac{1}{3a-b} =$  \_\_\_\_\_

A.  $\frac{4a}{9a^2-b^2}$

B.  $\frac{4a-b}{9a^2-b^2}$

C.  $\frac{4a+b}{9a^2-b^2}$

D.  $\frac{b}{9a^2-b^2}$

11. If  $x$  is no longer than 10, then \_\_\_\_\_

A.  $x \geq 8$

B.  $x \leq 10$

C.  $x < 10$

D.  $x > 10$

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

A. I

B. II

C. III

D. IV

13. Distance between the points  $(1, 0)$  and  $(0, 1)$  is:

A. 0

B. 1

C.  $\sqrt{2}$

D. 2

14. One angle on the base of an isosceles triangles  $30^\circ$ . What is the measure of its vertical angle?
- A.  $30^\circ$
  - B.  $60^\circ$
  - C.  $90^\circ$
  - D.  $120^\circ$
15. \_\_\_\_\_ congruent triangles can be made by joining the points of the sides of a triangle.
- A. Three
  - B. Four
  - C. Five
  - D. Two

# Multan Board 2021

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

### Mathematics

#### Group - I

#### Section - I

2. Attempt any six parts.

12=2x6

(i) Find the multiplicative inverse of  $C = \begin{bmatrix} -2 & 6 \\ 3 & -9 \end{bmatrix}$

(ii) Multiply the given matrices  $\begin{bmatrix} 8 & 5 \\ 6 & 4 \end{bmatrix} \begin{bmatrix} 2 & -\frac{5}{2} \\ -4 & 4 \end{bmatrix}$

(iii) Evaluate  $(-i)^8$

(iv) Simplify  $\sqrt{25x^{10n}y^{8n}}$

(v) Find the value of x from  $\log_x 64 = 2$

(vi) Calculate  $\log_5 3 \times \log_3 25$

(vii) Find the conjugate of  $x + \sqrt{y}$        $7 - \sqrt{6}$

(viii) Reduce into lowest form  $\frac{120x^2y^3z^5}{30x^3yz^2}$

(ix) Factorize  $12x^2 - 36x + 27$

3. Attempt any six parts.

12=2x6

(i) Find the H.C.F of the expression  $102xy^2z, 85x^2yz, 187xyz^2$

(ii) Solve the equation  $\frac{2}{3}x - \frac{1}{2}x = x + \frac{1}{6}$

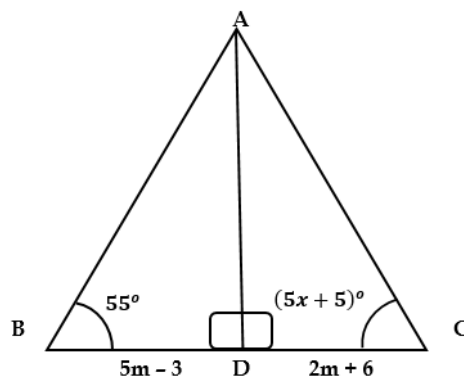
(iii) Solve for x       $|2x + 5| = 11$

(iv) Verify whether the point (0,0) lie on the line  $2x - y + 1 = 0$  or not.

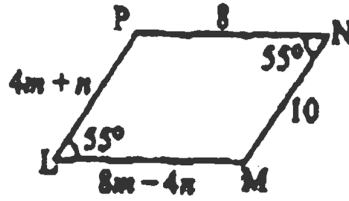
(v) Draw the graph  $y = 7$

(vi) Define square.

(vii) Find the value of unknown for the given conjugate triangle:

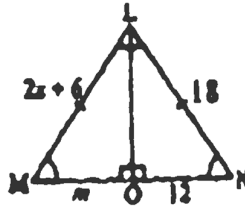


- (viii) Sum of the opposite angles of the parallelogram is  $110^\circ$ . Find the remaining angles.



4. Attempt any six parts. 12=2x6

- (i) If  $\triangle LMO \cong \triangle LNO$  then find  $x$  and  $m$ .

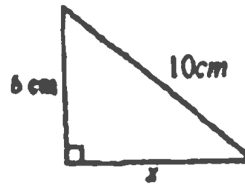


- (ii) Verify that difference of given measures of any two sides of a triangle is less than the measure of the third side. 13cm, 12cm, 5cm

- (iii) Define congruent triangles.

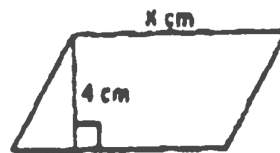
- (iv) These sides of a triangle are of measures 8,  $x$  and 17 respectively. For what value of  $x$  will become base of a right-angles triangle?

- (v) Find 'x' in the given figure:



- (vi) Define Altitude of height of a triangle.

- (vii) Find the area of a given figure:



- (viii) Construct  $\triangle XYZ$   $m\angle Y = 90^\circ$ ,  $m\overline{ZX} = 6.4\text{cm}$ ,  $m\overline{YZ} = 2.4\text{cm}$

- (ix) Define Orthocentre.

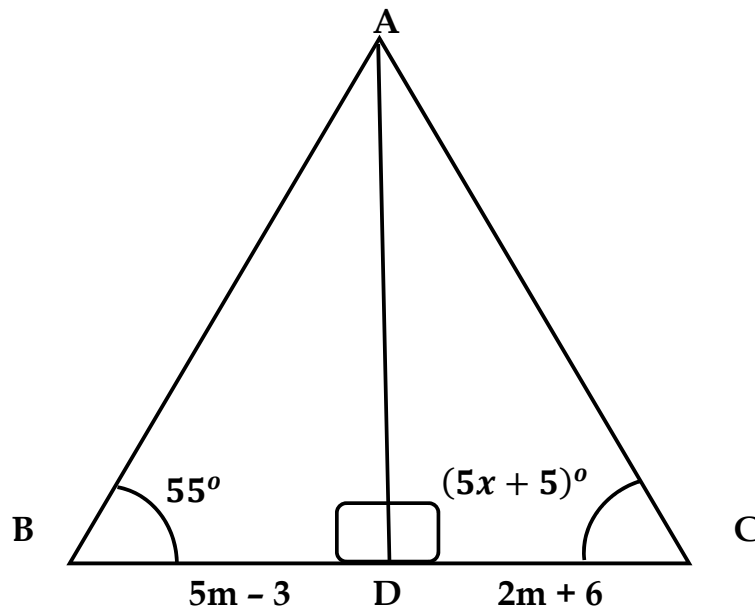
### Section - II

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

5. (A) If  $A = \begin{bmatrix} 4 & 0 \\ -1 & 2 \end{bmatrix}$ ,  $D = \begin{bmatrix} 3 & 1 \\ -2 & 2 \end{bmatrix}$  then verify that  $(DA)^{-1} = A^{-1}D^{-1}$
- (B) Use laws of exponent to simplify.  $\frac{(243)^{2/3} \cdot (32)^{-1/5}}{\sqrt{(196)^{-1}}}$
6. (A) Find the value by logarithm  $\frac{(438)^3 \sqrt{0.056}}{(388)^4}$
- (B) If  $q = \sqrt{5} + 2$  then find  $q^2 + \frac{1}{q^2}$
7. (A) Factorize  $a^4 + 3a^2b^2 + 4b^4$
- (B) Simplify  $\frac{x^4 - 8x}{2x^2 + 5x - 3} \times \frac{2x - 1}{x^2 + 2x + 4} \times \frac{x + 3}{x^2 - 2x}$
8. (A) Solve the equation  $\frac{x}{3x - 6} = 2 - \frac{2x}{x - 2}$ ,  $x \neq 2$
- (B) Construct the triangle ABC and draw the perpendicular bisectors of its sides.  $m\overline{AB} = 5.3\text{cm}$ ,  $m\angle A = 45^\circ$ ,  $m\angle B = 30^\circ$
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.



# Multan Board 2021

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

### Mathematics

#### Group - II

- The order of matrix  $\begin{bmatrix} 2 & 1 \end{bmatrix}$  is:
  - 2 - by - 1
  - 1 - by - 2
  - 1 - by - 1
  - 2 - by - 2
  
- If  $\begin{vmatrix} 2 & 6 \\ 3 & x \end{vmatrix} = 0$ , then x is equal to:
  - 9
  - 6
  - 6
  - 9
  
- When  $\sqrt[7]{x}$  in exponential form:
  - x
  - $x^7$
  - $x^{\frac{1}{7}}$
  - $x^{\frac{7}{2}}$
  
- In  $\sqrt[3]{35}$  the radicand is \_\_\_\_\_
  - 3
  - $\frac{1}{3}$
  - 35
  - 2



5. The relation  $y = \log_z x$  implies \_\_\_\_\_

A.  $x^y = z$

B.  $z^y = x$

C.  $x^z = y$

D.  $y^z = x$

6.  $\log p - \log q =$  \_\_\_\_\_

A.  $\log\left(\frac{q}{p}\right)$

B.  $\log(p - q)$

C.  $\frac{\log p}{\log q}$

D.  $\log\left(\frac{p}{q}\right)$

7.  $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b})$  is equal to:

A.  $a^2 + b^2$

B.  $a^2 - b^2$

C.  $a - b$

D.  $a + b$

8. Factors of  $3x^2 - x - 2$  are:

A.  $(x + 1), (3x - 2)$

B.  $(x + 1), (3x + 2)$

C.  $(x - 1), (3x - 2)$

D.  $(x - 1), (3x + 2)$

9. H.C.F of  $5x^2y^2$  and  $20x^3y^3$  is:

A.  $5x^2y^2$

B.  $20x^3y^3$

C.  $100x^5y^5$

D.  $5xy$

10. The square root of  $a^2 - 2a + 1$  is:

A.  $\pm(a + 1)$

B.  $\pm(a - 1)$

C.  $a - 1$

D.  $a + 1$

11. If  $x$  is no longer 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. Distance between the points  $(0, 0)$  and  $(1, 1)$  is:

A. 0

B. 1

C. 2

D.  $\sqrt{2}$

14. The right bisector of the three sides of a triangle are:

A. Congruent

B. Collinear

C. Concurrent

D. Parallel

15. The diagonals of a parallelogram \_\_\_\_\_ each other.

A. Bisect

B. Trisect

C. Bisect at right angle

D. Do not cross

# Multan Board 2021

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

### Mathematics

#### Group - II

#### Section - I

### 2. Attempt any six parts.

12=2x6

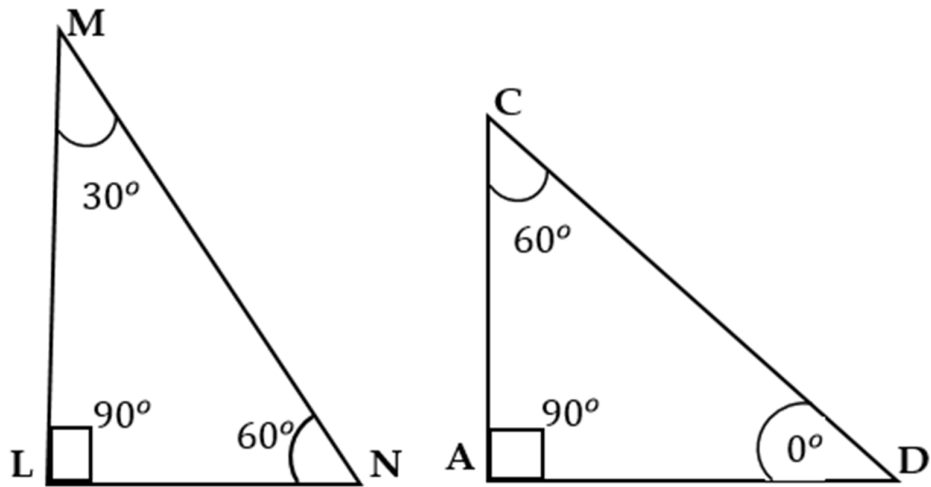
- (i) If  $\begin{bmatrix} a+3 & 4 \\ 6 & b-1 \end{bmatrix} = \begin{bmatrix} -3 & 4 \\ 6 & 2 \end{bmatrix}$  then find a and b.
- (ii) Find the multiplicative Inverse of  $D = \begin{bmatrix} 1 & 3 \\ 2 & 4 \\ 1 & 2 \end{bmatrix}$
- (iii) Evaluate  $i^{50}$
- (iv) Simplify and write in the form of  $a + bi$   $\frac{9-7i}{3+i}$
- (v) Find the value of x from  $\log_2 x = 5$
- (vi) Write the following into sum or difference  $\log \frac{(22)^{\frac{1}{3}}}{5^3}$
- (vii) Find the conjugate of  $+\sqrt{y} \cdot 2 + \sqrt{3}$
- (viii) Simplify  $(x^2 - 49) \cdot \frac{5x+2}{x+7}$
- (ix) Factorize  $3x - 243x^3$

### 3. Attempt any six parts.

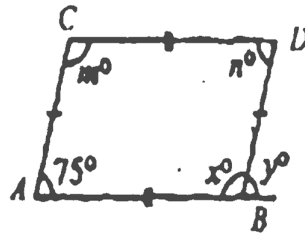
12=2x6

- (i) Find the H.C.F by factorization  $x^2 + 5x + 6, x^2 - 4x - 12$
- (ii) Solve the equation  $3\sqrt{2x-4} - 2 = 0$
- (iii) Solve for x,  $\left| \frac{x+5}{2-x} \right| = 6$
- (iv) Determine the equidistant of the coordinate plane in which the following points lie: (i) R(2, 2) (ii) S(2, -6)
- (v) Define Right Triangle.
- (vi) Define Right Triangle.
- (vii) Find the mid-point of the line segment joining A(9, 2), B(7, 2).
- (viii) If  $\triangle ABC \cong \triangle LMN$  then find
- (a)  $m\angle M \cong$  \_\_\_\_\_

(b)  $m\angle M \cong$  \_\_\_\_\_



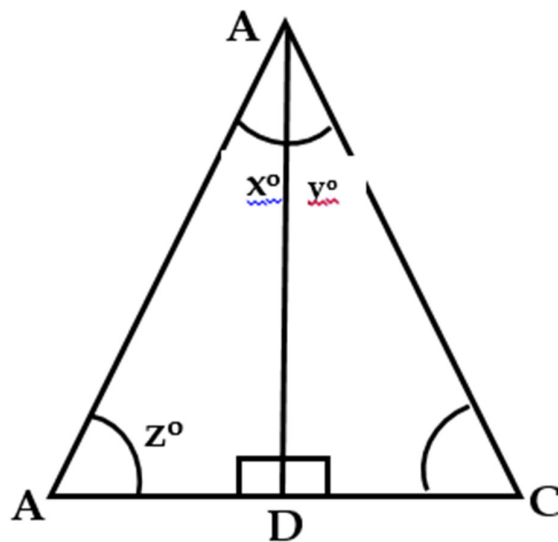
(ix) Find the unknown values  $x^\circ$ ,  $y^\circ$ ,  $m^\circ$  and  $n^\circ$  in the given figure.



4. Attempt any six parts.

12=2x6

(i)  $\overline{AD}$  is bisector of angle A for the given equilateral triangle ABC. Find unknown values of  $x^\circ$ ,  $y^\circ$  and  $z^\circ$



(ii) What will be the angle for shortest distance between from an outside point to the line?

(iii) Define proportion.

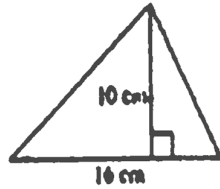
(iv) Find 'x' in the given figure.



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

(vi) Define Rectangular region.

(vii) Find the area of given figure:



(viii) Construct  $\triangle ABC$  in which  $m\overline{AB} = 3\text{cm}$ ,  $m\overline{AC} = 3.2\text{cm}$ ,  $m\angle A = 45^\circ$

(ix) Define circumcenter.

### Section - II

NOTE: Attempt any three questions. Question No. 9 is compulsory.

24=8x3

5. (A) If  $A = \begin{bmatrix} 4 & 0 \\ -1 & 2 \end{bmatrix}$ ,  $B = \begin{bmatrix} -4 & -2 \\ 1 & -1 \end{bmatrix}$  the verify that  $(AB)^{-1} = B^{-1}A^{-1}$

(B) Use laws of exponent to simplify:  $\frac{(81)^x \cdot 3^5 - (3)^{4x-1} \cdot (243)}{(9^{2x})(3^3)}$

6. (A) Find the value by using log tables.  $\frac{(1.23)(0.6975)}{(0.0075)(1278)}$

(B) If  $p = 2 + \sqrt{3}$  then find  $p^2 - \frac{1}{p^2}$

7. (A) Factorize  $25x^2 - 10x + 1 - 36z^2$

(B) Use factorization to find Square root.  $\frac{4x^4 - 12x^3y^3 + 9y^6}{9x^4 + 24x^2y^2 + 16y^4}$

8. (A) Solve the equation  $\frac{x}{3x-6} = 2 - \frac{2x}{x-2}$ ,  $x \neq 2$

(B) Construct  $\triangle XYZ$  and draw its medians.

$$m\overline{ZX} = 4.3\text{cm}, m\angle X = 75^\circ, m\angle Y = 45^\circ.$$

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

Or

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