



# INDIAN SCHOOL AL WADI AL KABIR

## *Revision Question Paper*

Mid-term Examination (2023-24)

**Sub: MATHEMATICS**

Date: 10-09-2023

Class: IX

Time: 3 hours

Maximum marks: 80

### **General Instructions**

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Questions of 5 marks, 2 Questions of 3 marks and 2 Questions of 2 marks has been provided.  
An internal choice has been provided in the 2marks questions of Section E.

### **SECTION A**

**Section A consists of 20 questions of 1 mark each.**

Q.1.	The simplest rationalizing factor of $\frac{1}{\sqrt{12}}$ is							
	A	$\sqrt{12}$	B	$\sqrt{3}$	C	$\sqrt{4}$	D	$\frac{1}{\sqrt{12}}$
Q.2.	Which of the following needs a proof?							
	A	Theorem	B	Axiom	C	Definition	D	Postulate

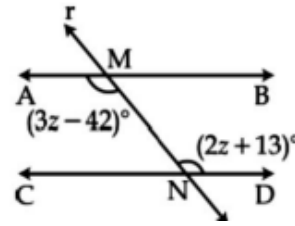
Q.3.	The length of the sides of a triangle are 4 cm, 6 cm and 8 cm. The length of perpendicular from the opposite vertex to the side whose length is 8 cm, is equal to							
	A	$\frac{3}{4}\sqrt{15}$ cm	B	$\frac{5}{4}\sqrt{15}$ cm	C	$\frac{3}{4}\sqrt{5}$ cm	D	$\frac{5}{4}\sqrt{3}$ cm
Q.4.	The value of x from the given figure, if $l \parallel m$ is							
A	$15^\circ$	B	$10^\circ$	C	$19^\circ$	D	$36^\circ$	
Q.5.	If $\sqrt{3} = 1.732$ , evaluate $\frac{1}{2} + \sqrt{3}$							
	A	2.232	B	6.732	C	3.232	D	3.732
Q.6.	The area of an equilateral triangle is $3\sqrt{3} \text{ cm}^2$ . The semi-perimeter of the triangle (in cm) is							
	A	$4\sqrt{3}$ cm	B	$3\sqrt{3}$ cm	C	$6\sqrt{3}$ cm	D	$9\sqrt{3}$ cm
Q.7.	If a number Y is greater than a number X and another number $Z < 0$ , then							
	A	$X \times Z = Y \times Z$	B	$X \div Z = Y \div Z$	C	$X - Z = Y$	D	$X + Z = Y$
Q.8.	The value of $(\sqrt{2} + \sqrt{3})(\sqrt{2} - \sqrt{3})$ is							
	A	5	B	-1	C	-5	D	1
Q.9.	An angle is $18^\circ$ less than its complementary angle. The measure of this angle is							
	A	$36^\circ$	B	$48^\circ$	C	$83^\circ$	D	$81^\circ$
Q.10.	A point $(x + 2, x + 4)$ lies in the first quadrant, the mirror image of this point with respect to x-axis is $(5, -7)$ . What is the value of x?							
	A	1	B	-1	C	2	D	3

Q.11.	The value of $\sqrt[4]{(16)^{-2}}$																			
	A	$\frac{1}{16}$	B	$\frac{1}{4}$	C	$\frac{1}{2}$	D	4												
Q.12.	A _____ may be drawn from any one point to any other point																			
	A	solid	B	plane surface	C	straight line	D	None of these												
Q.13.	If the supplement of an angle is three times its complement, then angle is																			
	A	$40^\circ$	B	$35^\circ$	C	$50^\circ$	D	$45^\circ$												
Q.14.	If the point A (2, 0), B (-6, 0) and C (3, a -3) lie on x-axis, find the value of a.																			
	A	2	B	3	C	6	D	0												
Q.15.	To draw a histogram to represent the following frequency distribution, the adjusted frequency for the class 25-45 is:																			
			<table border="1"> <tbody> <tr> <td>Class interval</td> <td>5-10</td> <td>10-15</td> <td>15-25</td> <td>25-45</td> <td>45-75</td> </tr> <tr> <td>Frequency</td> <td>6</td> <td>12</td> <td>10</td> <td>8</td> <td>15</td> </tr> </tbody> </table>						Class interval	5-10	10-15	15-25	25-45	45-75	Frequency	6	12	10	8	15
	Class interval	5-10	10-15	15-25	25-45	45-75														
Frequency	6	12	10	8	15															
A	2	B	3	C	5	D	6													
Q.16.	A student is given three sticks of length 6 cm, 5 cm, 3 cm respectively. His friend asked him to make a triangle with the help of these sticks and find its area.																			
	A	$2\sqrt{7} \text{ cm}^2$	B	$7\sqrt{14} \text{ cm}^2$	C	$4\sqrt{14} \text{ cm}^2$	D	$2\sqrt{14} \text{ cm}^2$												
Q.17.	If x is the midpoint and 1 is the upper limit of a class in a continuous frequency distribution, then the lower limit of the class is																			
	A	$x - 1$	B	$3x + 8$	C	$2x + 2$	D	$2x - 1$												
Q.18.	The point whose ordinate is 8 and lies on y-axis is																			
	A	(0, 8)	B	(8, 0)	C	(5, 8)	D	(8, 5)												

	<p><b>DIRECTION:</b> In question numbers 19 and 20, a statement of <b>Assertion (A)</b> is followed by statement of <b>Reason (R)</b>. Choose the correct option</p> <p>a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)</p> <p>(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A)</p> <p>(c) Assertion (A) is true but reason (R) is false.</p> <p>(d) Assertion (A) is false but reason (R) is true.</p>
Q.19.	<p><b>Statement A (Assertion):</b> The height of the triangle is 18 cm and its area is <math>72 \text{ cm}^2</math>. Its base is 8 cm</p> <p><b>Statement R (Reason):</b> Area of a triangle = <math>\frac{1}{2}</math> x base x height</p>
Q.20.	<p><b>Statement A (Assertion):</b> 7 is a rational number</p> <p><b>Statement R (Reason):</b> The square root of a rational number is irrational.</p>
<b>SECTION B</b>	
<b>Section B consists of 5 questions of 2 marks each.</b>	
Q.21.	<p>Show that <math>2.2 \overline{18}</math> can be expressed in the form <math>\frac{p}{q}</math>, where p and q are integers and <math>q \neq 0</math></p> <p style="text-align: center;"><b>OR</b></p> <p>Find the value of <math>\frac{4}{216 \frac{-2}{3}} - \frac{1}{256 \frac{-3}{4}}</math></p>
Q.22.	<p>Find the area of a triangle whose perimeter is 180cm and its two sides are 80cm and 18cm. Calculate the altitude of the triangle corresponding to its shortest side.</p>
Q.23.	<p>State any two Euclid's (i) axioms (ii) postulates</p>
Q.24.	<p>In the given figure <math>AB \parallel CD</math>. Find the value of x.</p>

**OR**

In the figure  $AB \parallel CD$  find the value of  $z$ ,  $\angle DNM$  and  $\angle CNM$ .

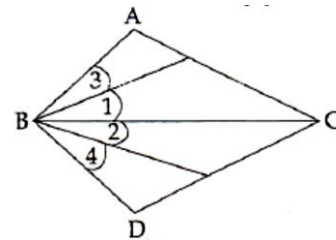


- Q.25.** Plot the points  $(-3, 0)$ ,  $(5, 0)$ ,  $(0, 4)$  on Cartesian plane. Name the figure formed by joining these points and find its area.

**SECTION C**

**Section C consists of 6 questions of 3 marks each.**

- Q.26.** In the given figure,  $\angle 1 = \angle 2$  and  $\angle 3 = \angle 4$ . Show that  $\angle ABC = \angle DCB$ .  
State the Euclid's axiom used.



- Q.27.** Represent  $\sqrt{8.2}$  geometrically on the number line.

**OR**

Represent  $\sqrt{3}$  on the number line.

- Q.28.** In which quadrant or on which axis do each of the following points lie?  
P  $(9,0)$ , Q  $(-5, -5)$ , R  $(4,3)$ , S  $(-2,4)$ , T  $(8, -6)$ , U  $(0,6)$

- Q.29.** Prove that if two lines intersect each other, then the vertically opposite angles are equal.

**OR**

If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

<b>Q.30.</b>	If $x = 4 - \sqrt{15}$ , then find the value of $(x + \frac{1}{x})^2$
<b>Q.31</b>	<p>The maximum temperatures (in degree Celsius) reported in a city for the month of April by the Meteorological Department, are given below:</p> <p>27.4, 28.3, 23.9, 23.6, 25.4, 27.5, 28.1, 30.5, 29.7, 30.6, 28.4, 31.7, 32.2, 32.6, 33.4, 35.7, 36.1, 37.2, 38.4, 40.1, 40.2, 40.5, 41.1, 42.0, 42.1, 42.3, 42.4, 42.9, 43.1, 43.2</p> <p>Construct a continuous grouped frequency distribution table.</p>

**SECTION D**

**Section D consists of 4 questions of 5 marks each.**

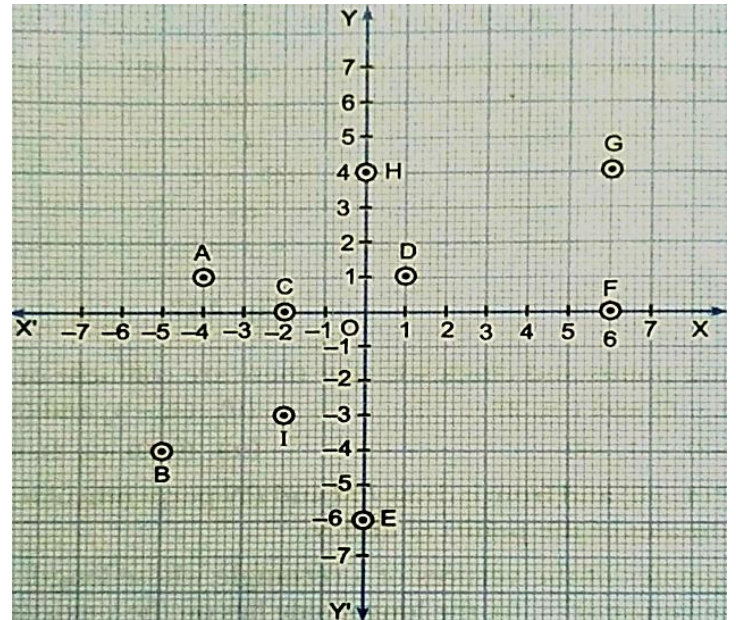
<b>Q.32.</b>	<p>Find <math>\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>Evaluate: <math>\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{9}{25}\right)^{\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]</math></p>
--------------	--

<b>Q.33.</b>	<p>The marks obtained (out of 100) by a class of 80 students are given below. Construct a histogram to represent the data.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 30%;">Marks</td> <td>10-20</td> <td>20-30</td> <td>30-50</td> <td>50-70</td> <td>70-100</td> </tr> <tr> <td>Number of students</td> <td>6</td> <td>17</td> <td>15</td> <td>16</td> <td>26</td> </tr> </table> <p style="text-align: center;"><b>OR</b></p> <p>The following table shows a frequency distribution of the speed of cars passing through a particular spot on a highway:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%;">Class interval (km/h)</td> <td>30-40</td> <td>40-50</td> <td>50-60</td> <td>60-70</td> <td>70-80</td> <td>80 - 90</td> <td>90 - 100</td> </tr> <tr> <td>Frequency</td> <td>3</td> <td>6</td> <td>25</td> <td>40</td> <td>50</td> <td>28</td> <td>14</td> </tr> </table> <p>Draw a histogram with frequency polygon for the data.</p>	Marks	10-20	20-30	30-50	50-70	70-100	Number of students	6	17	15	16	26	Class interval (km/h)	30-40	40-50	50-60	60-70	70-80	80 - 90	90 - 100	Frequency	3	6	25	40	50	28	14
Marks	10-20	20-30	30-50	50-70	70-100																								
Number of students	6	17	15	16	26																								
Class interval (km/h)	30-40	40-50	50-60	60-70	70-80	80 - 90	90 - 100																						
Frequency	3	6	25	40	50	28	14																						

Q.34.

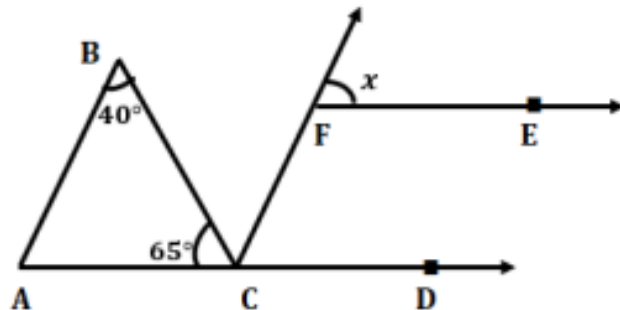
From the given figure, write

- a) the coordinates of the points B and F.
- b) the point identified by the coordinates (1, 1)
- c) the abscissa of the points D and H.
- d) the ordinates of the points A and C.
- e) the perpendicular distance of the point G from the x-axis.

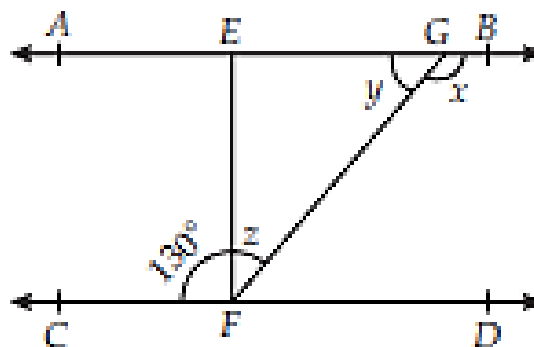


Q.35.

- (i) In the figure, if  $AB \parallel CF$  and  $CD \parallel FE$ , then find the value of  $x$ .



- (ii) In the figure,  $AB \parallel CD$ ,  $EF \perp CD$  and  $\angle GFC = 130^\circ$ . Find  $x$ ,  $y$  and  $z$ .



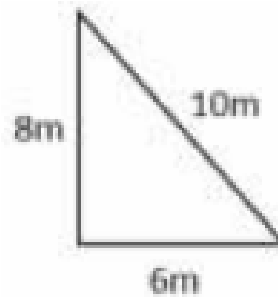
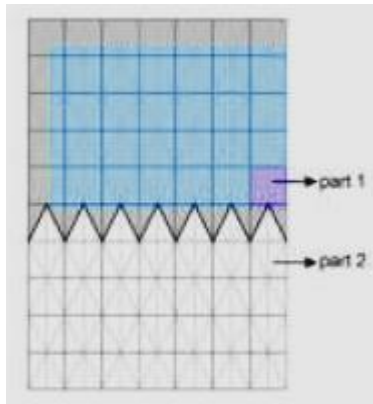
## SECTION E

**Case study- based questions are compulsory.**

**Q.36.**

**Case study-based 1**

Glass buildings can be strengthened using iron frames. A glass structure and its iron frame are shown below. The frame consists of equal triangles. The dimensions of a triangle are shown below.



Based on the above information answer the following questions:

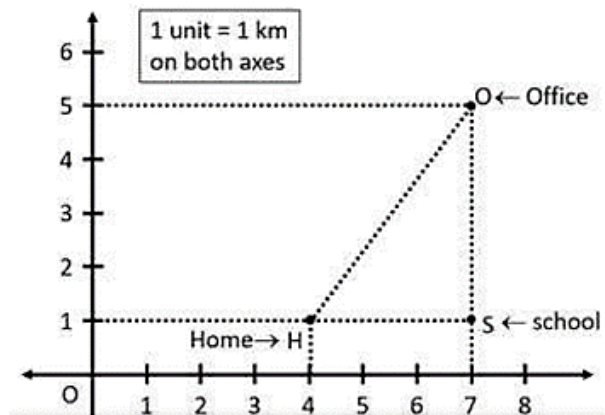
(i)	How much area is enclosed by one triangle?	1m
(ii)	What is the area of part 1 of the frame?	1m
(iii)	What is the area of part 2 of the frame?	2m
<b>OR</b>		
	Is the area of part 1 equal to the area of part 2? Why?	

**Q.37.**

**Case study-based 2**

Suman has to reach her office every day at 10:00 am. On the way to her office, she drops her son at school. Now, the location of Suman's house, her son's school and her office are represented by the map below.



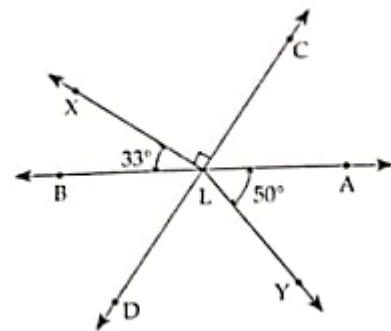
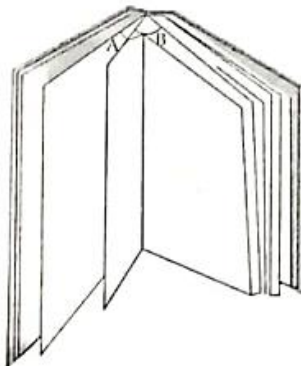


Based on the above information answer the following questions:

(i)	What are the coordinates of Suman's home?	1m
(ii)	What are the coordinates of her son's school?	1m
(iii)	Find the distance between Suman's home and her son's school.	2m
<b>OR</b>		
	Find the distance between Suman's office and her son's school.	

Q.38.

### Case study-based 3



Lines AB and CD intersect at L. LX and LY are two rays with L as the initial point.

Answer the following questions:

	(i)	Name three points which are collinear.	1m
	(ii)	Name a pair of adjacent complementary angles.	1m
	(iii)	Find the measure of $\angle CLA$ .  <b>OR</b>  Find the measure of reflex angle DLY.	2m

### Answers

Q.1	B	Q.2	A	Q.3	A	Q.4	A
Q.5	A	Q.6	B	Q.7	C	Q.8	B
Q.9	A	Q.10	D	Q.11	B	Q.12	C
Q.13	D	Q.14	B	Q.15	A	Q.16	D
Q.17	D	Q.18	A	Q.19	a	Q.20	c
Q.21	$\frac{122}{55}$ OR 80	Q.22	$720\text{cm}^2$ , 80cm	Q.24	$60^\circ$ OR $55^\circ$ , $123^\circ$ , $57^\circ$	Q.25	Triangle, 16 square units
Q.28	X-axis, III Quadrant, I, II, IV, Y-axis	Q.30	16	Q.32	5 OR 1	Q.34	a) (-5, -4) (6, 0) b) D c) 1, 0 d) 1, -2 e) 4 units
Q.35	(i) $75^\circ$ (ii) $150^\circ$ , $50^\circ$ , $40^\circ$	Q.36	(i) $24\text{m}^2$ (ii) $3696\text{m}^2$ (iii) $3024\text{m}^2$ OR No	Q.37	(i) (4, 1) (ii) (7, 1) (iii) 3 km OR 4km	Q.38	(i) A, L, B (ii) $\angle XLB$ , $\angle BLD$ (iii) $57^\circ$ OR $117^\circ$