



Indian School Al Wadi Al Kabir
Mid Term Examination (2026-27)

Class: VIII

MATHEMATICS

Max. Marks: 80

Date: 20-09-2026

SET - 1

Time: 2 ½ Hour.

Marking Scheme

General Instructions:

Section A: Multiple Choice Questions (Q.1 to Q.15)

& Source based Question (Q.16)

Section B: Short Answer Questions of 2 marks each (Q.17 to Q.21)

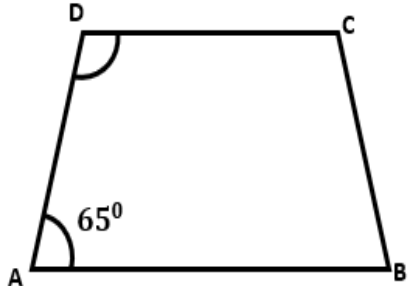
Section C: Long Answer Questions (Type – 1) of 3 marks each (Q.22 to Q.27)

Section D: Long Answer Questions (Type – 2) of 4 marks each (Q.28 to Q.33)

& Case study Questions (Q.34 & Q.35) of 4 marks each.

NOTE: This question paper consists of 5 printed pages.

SECTION A Multiple Choice Question (Q.1 to Q.15)								
1.	The product of $(2x + 3)(x + 4)$ is:							1M
	A		B	$2x^2 + 11x + 12$	C		D	
2.	For a class art activity, the teacher provided 45 red pencils and 60 blue pencils. Write the ratio of red pencils to blue pencils in its simplest form.							1M
	A		B		C	$3 : 4$	D	
3.	$1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = \underline{\hspace{2cm}}$.							1M
	A		B		C		D	64
4.	Which of the following number is divisible by both 3 and 9							1M
	A	4212	B		C		D	
5.	Find the value of 'x' in the given proportion, $7 : 9 = 21 : x$							1M
	A		B		C	27	D	
6.	Using identity find the product of $(9a + 7b)(9a - 7b)$:							1M
	A		B	$81a^2 - 49b^2$	C		D	
7.	In parallelogram PQRS, if $\angle Q = 70^\circ$, then the measure of $\angle S$ is:							1M
	A	70°	B		C		D	

8.	If 4 notebooks cost ₹80, how much will 7 notebooks cost?							1M
	A	₹140	B		C		D	
9.	Express 51,860,000,000 in standard form using powers of 10.							1M
	A		B		C	5.186×10^{10}	D	
10.	For an art project, Jiya wants to make a square-shaped piece of coloured paper. The side length of the square is 14 cm. What is the area of the square?							1M
	A	$196cm^2$	B		C		D	
11.	In trapezium ABCD, $AB \parallel CD$. If $\angle A = 65^\circ$, find $\angle D$.							1M
	A		B	115°	C		D	
12.	The digital root of the number 849710 is:							1M
	A		B		C	2	D	
13.	The multiplicative inverse(reciprocal) of $(23)^{-5}$ is:							1M
	A	$(23)^5$	B		C		D	
14.	$\sqrt[3]{216 \times 125} =$							1M
	A		B		C		D	30
15.	The angles of a quadrilateral are 120° , 65° , 95° and x° . The measure of x is:							1M
	A		B	80°	C		D	

16.	Source based question(5 Marks): During a science exhibition, students prepared a model showing the growth of bacteria. The teacher explained that bacteria can multiply rapidly. In one experiment, the number of bacteria doubles every hour. At the beginning, there was 2^3 bacteria. The students used exponents to represent the increasing number of bacteria.							
I	How many bacteria were present at the beginning?							1M
	A		B	8	C		D	
II	After 2 hours, the number of bacteria can be represented as:							1M
	A		B	$2^3 \times 2^2$	C		D	
III	Use the laws of exponents to simplify: $2^3 \times 2^2$							1M
	A	2^5	B		C		D	
IV	The value of 2^5 is:							1M
	A		B		C	32	D	
V	If the number of bacteria is written as 3.2×10^6 , its usual form is:							1M
	A		B	3200000	C		D	
	SECTION B: Short Answer Questions (Q17 to Q21)-2 marks each							
17.	A library has $(x - 3)$ shelves, and each shelf contains $(x + 2)$ books. Find the total number of books in the library.							2M
Ans	$(x - 3)(x + 2) = x^2 - 3x + 2x - 6$ ----- $\frac{1}{2}$ $= x^2 - x - 6$ ----- $\frac{1}{2}$							
18.	A shopkeeper sells 300 g of dry fruits for ₹240. Another shop sells 1 kg of the same dry fruits for ₹720. Are the weight-to-price ratios proportional? Which shop is more expensive?							2M
Ans	Shop 1: 300 g : ₹240 For 1 kg = 1000 g ----- $\frac{1}{2}$ Cost = $(240/300) \times 1000 = ₹800$ ----- $\frac{1}{2}$ Shop 2: 1 kg : ₹720							



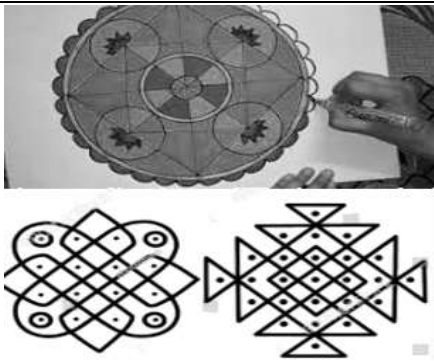
	Since ₹800 $\neq$ ₹720, the ratios are not proportional. ----- $\frac{1}{2}$ Shop 1 is more expensive----- $\frac{1}{2}$	
19.	Use repeated subtraction of consecutive odd numbers to determine whether 49 is a perfect square. If it is, find its square root.	2M
Ans	Using repeated subtraction of consecutive odd numbers: 49-1=48 48-3=45 45-5=40 40-7=33 33-9=24 ----- $1\frac{1}{2}$ marks 24-11=13 13-13=0 Since we reach 0 after subtracting 7 odd numbers , 49 is a perfect square. $\sqrt{49}=7$ ----- $\frac{1}{2}$ marks	
20.	A school collected 2,436 notebooks for a charity drive. The teacher wants to arrange the notebooks into 6 equal groups without any notebook left over. Using the divisibility rule for 6, determine whether 2,436 is divisible by 6. Give a reason for your answer.	2M
Ans	2,436 ends in 6, so it is divisible by 2. ----- $\frac{1}{2}$ marks 2+4+3+6=15, and 15 is divisible by 3 ----- 1 marks Therefore, 2,436 is divisible by 6. ----- $\frac{1}{2}$ marks	
21.	Simplify and find value of $(5^4)^2 \div 5^6$ using laws of exponents.	2M
Ans	Using the laws of exponents: $(5^4)^2 \div 5^6 = 5^8 \div 5^6$ ----- 1 marks $= 5^2$ ----- $\frac{1}{2}$ marks $= 25$ ----- $\frac{1}{2}$ marks	
	SECTION C: Long Answer Questions (Type – 1) of 3 marks each (Q.22 to Q.27)	
22.	Expand and simplify the expression: $2(x - 1) + 3(x + 4) - 5x$.	3M
Ans	$2(x - 1) + 3(x + 4) - 5x = 2x - 2 + 3x + 12 - 5x$ ----- 2 marks $= (2x + 3x - 5x) + (-2 + 12)$ ----- $\frac{1}{2}$ marks $= 10$ ----- $\frac{1}{2}$ marks	
23.	Three groups of students planted 720 saplings for a school garden. The numbers of saplings planted by the groups were in the ratio 2 : 3 : 5. How many saplings did each group plant?	3M

Ans	The ratio is 2:3:5 Sum of ratio= $2+3+5=10$ ----- $\frac{1}{2}$marks First group: $\frac{2}{10} \times 720 = 144$ saplings ----- 1mark Second group: $\frac{3}{10} \times 720 = 216$ saplings ----- 1mark Third group: $\frac{5}{10} \times 720 = 360$ saplings ----- $\frac{1}{2}$marks		
24.	A school is preparing cube-shaped gift boxes for a mathematics exhibition. Each box has a volume of $1,728 \text{ cm}^3$. The students need to find the length of each side of the cube. Using prime factorisation, find the cube root of 1,728 and hence determine the side length of the gift box.		3M
Ans	$1728 = 2^6 \times 3^3$ ----- 2marks $\sqrt[3]{1728} = 2 \times 2 \times 3$ ----- $\frac{1}{2}$marks $= 12$ ----- $\frac{1}{2}$marks Therefore, the side length of the cube = 12 cm	$1728 \div 2 = 864$ $864 \div 2 = 432$ $432 \div 2 = 216$ $216 \div 2 = 108$ $108 \div 2 = 54$ $54 \div 2 = 27$ $27 \div 3 = 9$ $9 \div 3 = 3$ $3 \div 3 = 1$ (prime factorisation)	
25.	Using divisibility test, check the following numbers are divisible by or not: (show working for both) a) 256348 by 4 b) 2543617 by 11		3M
Ans	a) 256348 by 4 The last two digits are 48. $48 \div 4 = 12$ Since 48 is divisible by 4, 256348 is divisible by 4. ----- $1 \frac{1}{2}$marks b) 2543617 by 11 Using the divisibility rule for 11: $= (2+4+6+7) - (5+3+1)$ $= 19 - 9 = 10$ Since 10 is not divisible by 11 Therefore, 2543617 is not divisible by 11. ----- $1 \frac{1}{2}$marks		
26.	Construct parallelogram $EFGH$, given that $EF = 7.5 \text{ cm}$, $FG = 5 \text{ cm}$ and $\angle EFG = 120^\circ$.		3M
Ans	Steps: Method 1 1. Draw $EF = 7.5$ ----- $\frac{1}{2}$marks 2. At F, construct an angle of 120°. ----- 1 marks		

	3. At E, construct $180-120=60^\circ$ ----- $\frac{1}{2}$marks 4. Mark $FG=5$ and $EH=5$ using compass. ----- $\frac{1}{2}$marks 5. Join the arcs, get required parallelogram ----- $\frac{1}{2}$marks	
27.	Simplify the following: (a) $\{(7)^{-2} \times (7)^5\} \div 7$ (b) $\left[\frac{(5^0+13^0)\times 4}{2^2}\right]^2 + 2^3$	3M
Ans	(a) $\{(7)^{-2} \times (7)^5\} \div 7 = (7)^3 \div 7$ ----- $\frac{1}{2}$marks $= (7)^{3-1}$ ----- $\frac{1}{2}$marks $= (7)^2 = 49$ ----- $\frac{1}{2}$marks (b) $\left[\frac{((5^0+13^0)\times 4)}{2^2}\right]^2 + 2^3 = \left[\frac{(1+1)\times(4)}{2^2}\right]^2 + 2^3$ ----- $\frac{1}{2}$marks $= \left[\frac{2\times 2^2}{2^2}\right]^2 + 2^3$ $= [2]^2 + 2^3$ ----- $\frac{1}{2}$marks $= 4+8=12$ ----- $\frac{1}{2}$marks	
	SECTION D: Long Answer Questions (Type – 2) (Q.28 to Q.33) & Case study (Q.34 &35) of 4 marks each	
28.	Use suitable identities to find the value of the following: a) $(103)^2$ b) 78×82	4M
Ans	a) $(103)^2$ Using the identity $(a + b)^2 = a^2 + 2ab + b^2$: $(103)^2 = (100 + 3)^2$ $= 100^2 + 2(100)(3) + 3^2$ $= 10000 + 600 + 9 = \boxed{10609}$ ----- 2 Marks b) 78×82 Using the identity $(a - b)(a + b) = a^2 - b^2$: $78 \times 82 = (80 - 2)(80 + 2)$ $= 80^2 - 2^2$ ----- 2 Marks $= 6400 - 4 = \boxed{6396}$	

29.	In a printing press a machine can produce 200 pages in 30 minutes: If x and y vary directly, find the values of x, y, z & w. <table><tr><td>Pages</td><td>200</td><td>x</td><td>300</td><td>z</td><td>w</td></tr><tr><td>Time (minutes)</td><td>30</td><td>75</td><td>y</td><td>120</td><td>90</td></tr></table>	Pages	200	x	300	z	w	Time (minutes)	30	75	y	120	90	4M
Pages	200	x	300	z	w									
Time (minutes)	30	75	y	120	90									
Ans	Since pages and time vary directly, $x = \frac{200}{30} \times 75 = 500 \text{ pages} \quad \text{-----1 mark}$ $y = \frac{30}{200} \times 300 = 45 \text{ minutes} \quad \text{-----1 mark}$ $z = \frac{200}{30} \times 120 = 800 \text{ pages} \quad \text{-----1 mark}$ $w = \frac{200}{30} \times 90 = 600 \text{ pages} \quad \text{-----1 mark}$													
30.	A tile manufacturer has produced 2,560 tiles for a special display. The manufacturer wants to arrange all the tiles in a perfect square formation. What is the smallest number by which 2,560 must be multiplied to make the resulting number a perfect square?	4M												
Ans	$2560 = 2^9 \times 5 \quad \text{-----}2\frac{1}{2} \text{ marks}$ For a perfect square, all prime factors must have even powers. $2^9 \times 5^1$ Both exponents are odd, so multiply by $2 \times 5 = 10$: -----1marks $2560 \times 10 = 25600$$\sqrt{25600} = 160$ Answer: 10 -----$\frac{1}{2}$ marks The smallest number is 10. $2560 \div 2 = 1280$$1280 \div 2 = 640$$640 \div 2 = 320$$320 \div 2 = 160$$160 \div 2 = 80$$80 \div 2 = 40$$40 \div 2 = 20$$20 \div 2 = 10$$10 \div 2 = 5$ $2560 = 2^9 \times 5$													
31.	Maya wrote four consecutive numbers on the board for a mathematics puzzle. Sum of the four numbers is 82. What are the four consecutive numbers?	4M												
Ans	Let the four consecutive numbers be: x, x + 1, x + 2, x + 3 -----1 marks Their sum is 82: $x + (x + 1) + (x + 2) + (x + 3) = 82 \quad \text{-----1 marks}$ $4x + 6 = 82 \quad \text{-----}\frac{1}{2} \text{ marks}$ $4x = 76 \quad \text{-----}\frac{1}{2} \text{ marks}$ $x = 19 \quad \text{-----}\frac{1}{2} \text{ marks}$ Therefore, the four consecutive numbers are: 19, 20, 21, 22 -----$\frac{1}{2}$ marks													

32.	Using ruler and compasses, construct a rhombus $KLMN$ whose diagonals measure 7 cm and 8 cm.	4M
Ans	1. Draw a line segment $KM=8$. -----1 mark 2. Construct the perpendicular bisector of KM. Let it intersect KM at O. -----1 $\frac{1}{2}$ marks 3. Since the diagonals of a rhombus bisect each other at right angles, mark L and N on the perpendicular bisector such that: $OL=ON=\frac{7}{2}=3.5$ cm -----1 marks 4. Join $K-L$, $L-M$, $M-N$ and $N-K$. -----1 $\frac{1}{2}$ marks	
33.	Express 648×405 as a product of powers of prime factors in exponential form:	4M
Ans	$648 = 2^3 \times 3^4$ -----2 marks $405 = 3^4 \times 5$ -----1 $\frac{1}{2}$ marks $648 \times 405 = (2^3 \times 3^4)(3^4 \times 5)$ $2^3 \times 3^8 \times 5$ -----1 $\frac{1}{2}$ marks $648 = 2^3 \times 3^4$ $405 = 3^4 \times 5$ $648 \div 2 = 324$ $324 \div 2 = 162$ $162 \div 2 = 81$ $81 = 3 \times 3 \times 3 \times 3$ $405 \div 5 = 81$ $81 = 3 \times 3 \times 3 \times 3$	
34.	CASE STUDY -1: A neighbourhood committee is working together to create a small community garden. They are making square nursery beds for growing plants, installing square solar panels to provide light, and preparing cube-shaped boxes for storing water and compost. 	4M
	a) One of the nursery beds is square-shaped, with each side measuring 12 m. What is the area of the bed? b) A square solar panel has an area of 324 cm^2. Find the length of one side of the panel? c) A cube-shaped compost box can hold 3375 cm^3 of compost. What is the length of each edge of the box? d) The committee records the area of a large square garden bed as $8,100 \text{ m}^2$. Without finding the exact square root, determine the number of digits in its square root.	
Ans	a) Side of square = 12 m Area = $12^2 = 144 \text{ m}^2$ -----1 marks b) Area of square = 324 cm^2 Side = $\sqrt{324} = 18 \text{ cm}$ -----1 marks c) Volume of cube = 3375 cm^3 Edge = $\sqrt[3]{3375} = 15 \text{ cm}$ -----1 marks	

	d) Area = 8100 m^2 Number of digits in the square root= 2 digits. -----1 marks		
35.	CASE STUDY-2: During a cultural celebration, an artist designs a large rangoli pattern using different geometric shapes. The central design contains a square, rectangle, rhombus and parallelogram. The artist uses the properties of these quadrilaterals to maintain symmetry and balance in the pattern.		4M
	a) The artist creates a diamond-shaped design in the centre of a rangoli. The design is a rhombus ABCD. If $\angle A = 70^\circ$, find the measures of $\angle C$. b) The diagonals of a parallelogram-shaped in the ragoli intersect at point O. If one part of a diagonal is 7 cm, what is the length of the other part of the same diagonal? c) A square in the rangoli has its side represented by $(3x + 4)$ cm, while an adjacent side is represented by $(5x - 10)$ cm. Find the value of x d) The artist creates a kite-shaped design in the rangoli. If one pair of adjacent sides measure 6 cm each and the other pair measures 4 cm each, find the perimeter of the kite.		
Ans	a) In a rhombus, opposite angles are equal. $\angle C = \angle A = 70^\circ$ -----1 marks b) The diagonals of a parallelogram bisect each other. If one part is 7 cm, the other part is also 7 cm -----1 marks c) All sides of a square are equal. $3x + 4 = 5x - 10$ $5x - 3x = 10 + 4$ $2x = 14$ $x = 7$ -----1 marks d) Perimeter= $6+6+4+4=20$ cm -----1 marks		