



Indian School Al Wadi Al Kabir

Mid Term Examination

Class: IX

MATHEMATICS

Time: 3 Hours

Date: 25-09-2022

SET-1

Max. Marks : 80

General Instructions:

1. This question paper is divided into 3 sections- A, B and C.
2. Section A- PART-1(MCQ) comprises of 6 questions of 1 mark each.
3. Section A- PART-2 (Very short answer) comprises of 16 questions of 1 mark each.
4. Section B- PART-1(Short answer) comprises of 5 questions of 2 marks each.
5. Section B- PART-2(Long answer) comprises of 4 questions of 3 marks each.
6. Section C- PART-1 (Case study) comprises of 4 questions of 4 marks each.
7. Section C - PART-2 comprises of 4 questions of 5 marks each.
8. Internal choice has been provided for certain questions.

Section A

PART-1(MCQ-1 mark each)

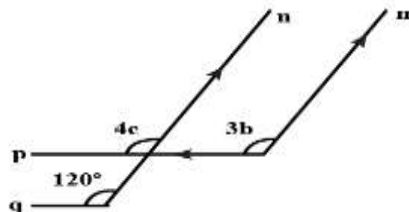
Q.1. $\sqrt{6} \times \sqrt{8}$ is equal to

- A $8\sqrt{3}$ B $4\sqrt{3}$ C $4\sqrt{5}$ D $6\sqrt{8}$

Q.2. A point whose abscissa is 3 and lies on x-axis is

- A (3,0) B (0,3) C (-3,0) D (0,0)

Q.3. If $p \parallel q$ and $m \parallel n$, then the value of b is



- A 30° B 80° C 120° D 40°

Q.4. The area of an equilateral triangle with side 8 cm is

- A $8\sqrt{3}$ B $4\sqrt{3}$ C $16\sqrt{3}$ D $2\sqrt{3}$

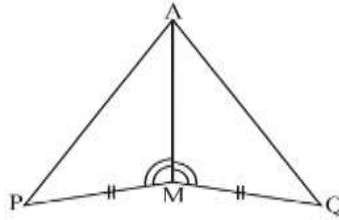
- Q.5.** In the class interval 60–70 and 70–80, the number 70 is included in
- A** 60–70 **B** 70–80 **C** Both the intervals **D** None of the intervals
- Q.6.** According to Euclid the number of chapter of elements are
- A** 16 **B** 24 **C** 23 **D** 13

Section A

PART-II (Very short answer-1 mark each)

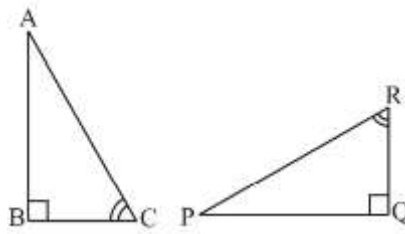
- Q.7.** Find the simplest rationalising factor of $\frac{1}{\sqrt{45}}$.
- OR**
- Simplify: $\sqrt{80} - \sqrt{20}$.
- Q.8.** Find the decimal representation of the number $\frac{9}{20}$. State the kind of decimal representation.
- Q.9.** Show that 0.833..... can be expressed in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
- Q.10.** Find the side of an equilateral triangle if the area is given by $100\sqrt{3} \text{ cm}^2$.
- Q.11.** The sides of a triangular board are in the ratio 3:5:7 and its perimeter is 300 m. Find the measurement of its sides.
- OR**
- Find the area of ΔABC in which $AB = AC = 4 \text{ cm}$ and $\angle A = 90^\circ$.
- Q.12.** The height and base of the triangle are 21 cm and 28 cm respectively. Find the area of the triangle.
- Q.13.** Two salesmen make equal sales during the month of June. In July, each salesman doubles his sale of the month of June. Compare their sales in July. State which axiom you use here.
- Q.14.** Find the class size of the class interval (135.5 – 145.5).

- Q.15.** The quadrilateral APMQ is divided into two triangles by the diagonal AM. State the congruency used if the two triangles are congruent.



OR

If $\triangle ABC$ and $\triangle PQR$ are to be congruent, name one additional pair of corresponding parts. What criterion did you use?

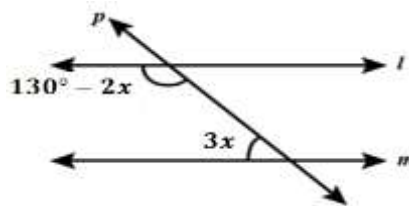


- Q.16.** Find the range of the data: 26, 3, 14, 7, 54, 98, 9, 67, 35 and 89.
- Q.17.** The class mark of the frequency distribution is 10–20, 20–30, 30–40... Find the class representing the class mark 25.

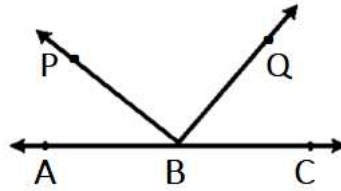
OR

In a frequency distribution, the class-width is 4 and the lower limit of first class is 10. If there are six classes, then find the upper limit of the last class.

- Q.18.** Find the value of x from the adjoining figure, if l is parallel to m .



Q.19. In the given figure, ABC is a straight line. If $\angle ABP + \angle CBQ = 95^\circ$, find $\angle PBQ$.



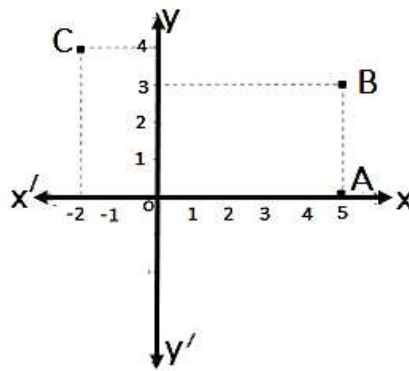
Q.20. Two angles measure $(30^\circ - a)$ and $(125^\circ + 2a)$. If each one is supplement of the other, then find the value of a .

Q.21. What will be the perpendicular distance of the point $(9,2)$ from y-axis?

OR

In which quadrant the points $(-3, -4)$ and $(4, -3)$ lies?

Q.22. Write the coordinates of points A, B and C from the graph.



Section B

PART-I (S.A.-2 marks each)

Q.23. Find the value of $(216)^{\frac{2}{3}} - (256)^{\frac{1}{4}}$.

OR

Evaluate $\frac{1}{\sqrt{2}} + \pi$. (Take approximately $\sqrt{2} = 1.414$ and $\pi = 3.141$).

Q.24. Find the area of the triangle whose perimeter is 32 m and the two sides are 8 m, 11 m respectively.

Q.25. In a school camp, 40 students were divided into two groups to play a game. The table given below shows the scores of team A and team B.

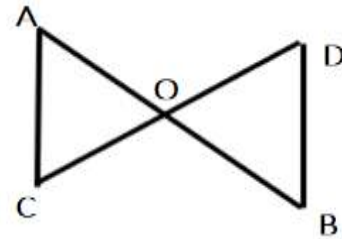
Time (in minutes)	Team A	Team B
0–5	14	20
5–10	35	27
10–15	30	31
15–20	35	31
20–25	44	37
25–30	52	50

- (i) How many scores did team A get between 15-30 minutes?
 (ii) Which team scored more points during last 5 minutes?

Q.26.

In figure AB and CD bisect each other at the point O.

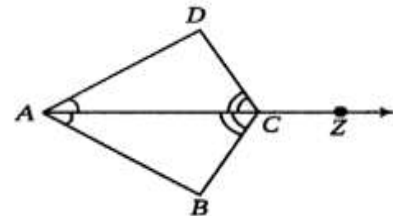
- (i) Show that $\Delta AOC \cong \Delta BOD$
 (ii) Is $AC = BD$? Why?



OR

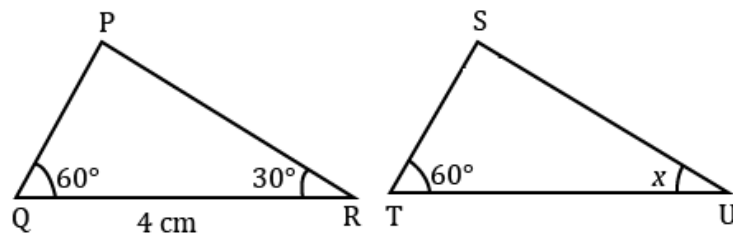
In the figure, ray AZ bisects $\angle DAB$ as well as $\angle DCB$.

- (i) Show that $\Delta BAC \cong \Delta DAC$
 (ii) Is $AD = AB$? Why?



Q.27.

- (i) In the given congruent triangles ($\Delta PQR \cong \Delta STU$) under ASA criteria, find the value of x and the measure of TU.
 (ii) Mention any other two corresponding parts of this congruent triangles.

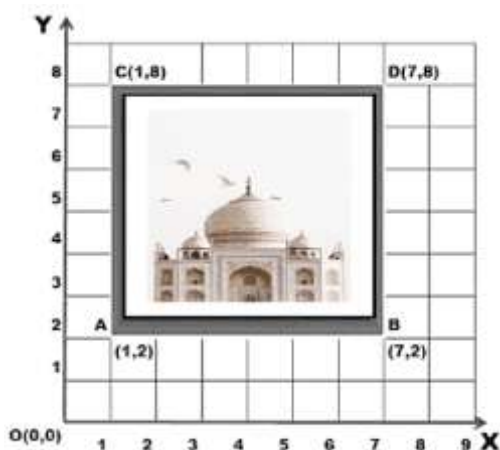


Section B-PART-II (CASE STUDY BASED QUESTIONS)

Q.28. CASE STUDY -I

Read the Source/Text given below and answer any four questions:

Rohit was putting up one of his paintings in his living room. Before this Rohit had put a grid on the wall where each unit measures equal to a foot. The upper left corner of the frame is a point C (1, 8) and upper right corner at D (7, 8). The bottom left corner is at A (1, 2) and the bottom right corner at B (7, 2). Answer the following questions:



QN. I Write the ordinate of point D.

A 7 B 8 C 1 D 2

QN. II What is the length of the painting with the frame?

A 6 foot B 12 foot C 3 foot D 12 cm

QN. III Join any one of its diagonals in the painting, find the area of the so formed triangle.

A 36 sq. units B 58 sq. units C 48 sq. units D 18 sq. units

QN. IV Find the perpendicular distance of point A from x axis.

A 1 B 2 C 7 D 8

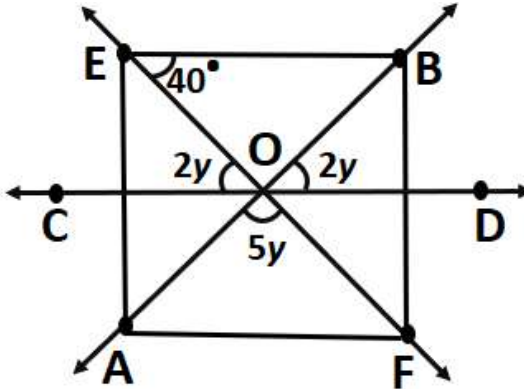
QN. V Among the given coordinates, write the points with equal abscissa.

A A and D B B and C C A and C D A and B

Q.29. CASE STUDY-II

Read the Source/Text given below and answer any four questions:

On the occasion of light festival, girls are asked to make Rangoli as per the figure given here. In the given figure AB, CD and EF are three lines intersecting at O as seen below. Also, $EB \parallel AF$ and $EA \parallel BF$ then answer the following questions.



QN. I If $\angle AOF = 5y$, $\angle COE = 2y$ and $\angle BOD = 2y$. Find the value of y .

- A** 40° **B** 180° **C** 100° **D** 20°

QN. II What is the measure of $\angle OFA$?

- A** 100° **B** 40° **C** 80° **D** 160°

QN. III Find the vertically opposite angle of $5y$.

- A** $\angle EOB$ **B** $\angle EOD$ **C** $\angle DOB$ **D** $\angle DOF$

QN. IV What is the reflex of $\angle EOB$.

- A** 80° **B** 360° **C** 260° **D** 100°

QN. V The angles in the straight-line COD can be taken in the ratio as

- A** 2:5:2 **B** 2:2:5 **C** 4:4:5 **D** 4:5:4

CASE STUDY BASED -III

- Q.30.** Triangles are used in bridges because they evenly distribute weight without changing their proportions. When force is applied on a shape like rectangle it would flatten out. Before triangles were used in bridges, they were weak and could not be very big. To solve that problem engineers would put a post in the middle of a square and make it more sturdy. Isosceles triangles were used to construct a bridge in which the base and equal sides of an isosceles triangle are in the ratio 1:2:2 and its perimeter is 200 m.



- (i) What are the measurements of the sides of an isosceles triangle?
(ii) What is the area of the above isosceles triangle? Also, find the cost of painting the so formed triangle at the rate of ₹ 8 per m^2 .

Q.31. CASE STUDY BASED-IV

Real numbers are extremely useful in everyday life. That is probably one of the main reasons we all learn how to count and add and subtract from a very young age. Real numbers help us to count and to measure out quantities of different items in various fields. Answer the following questions on real life-based situations.



- (i) Maya distributed chocolates on her birthday celebration. The number of chocolates distributed is given by $(15 + \sqrt{11})(15 - \sqrt{11})$. Find the number of chocolates distributed by her.
(ii) Her friends joined together to clean the area after celebrations. The cleaned area is given by $(\sqrt{5} + \sqrt{2})^2$ square metres.
a) Find the area cleaned by them by applying the appropriate identity.
b) Find the value of: $14\sqrt{10} - 2\sqrt{6} + 21\sqrt{6} + 3\sqrt{10}$.

Section C

PART-1 (S.A-3 marks each)

Q.32. If two lines intersect each other, then prove that the vertically opposite angles are equal.

Q.33. Represent $\sqrt{3}$ on the number line.

OR

If $x = \sqrt{7} - \sqrt{6}$, then find the value of $\left(x + \frac{1}{x}\right)^2$.

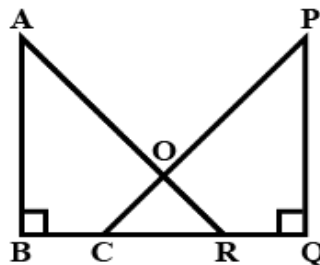
Q.34. State any three Euclid's axioms.

Q.35. In the adjoining figure, $AB=PQ$, $BC = QR$, $AB \perp BC$ and $PQ \perp QR$.

Show that (i) $BR = QC$

(ii) $\Delta ABR \cong \Delta PQC$

(iii) $AR = PC$.



Section C

PART-II (S.A-5 marks each)

Q.36. (i) If both a and b are rational numbers, find the values of a and b: $\frac{5 + \sqrt{3}}{7 + \sqrt{3}} = a + b\sqrt{3}$.

(ii) Find the value of $6\sqrt{32} \div 3\sqrt{8}$.

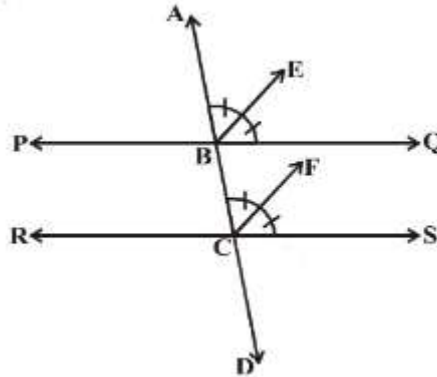
Q.37. On National Integration Day a poster is to be made by the students of class IX of a school. This poster is in the shape of a rectangle. All the students are given with triangular piece for the display.

(i) Sketch the rectangle three of whose vertices are A (0, -4), B(5, -4) and C(5,2).

(ii) Find its fourth vertex D.

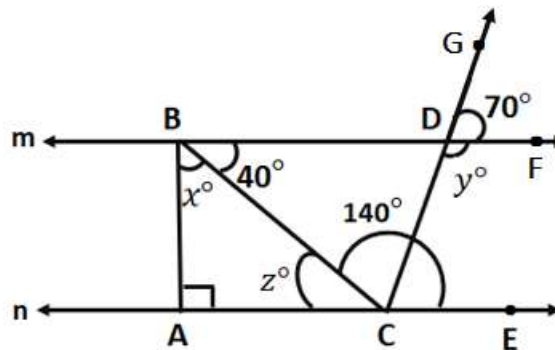
(iii) Find the perimeter of the given poster.

Q.38. 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.



OR

If $m \parallel n$ and BA perpendicular to the line n , $\angle BCE = 140^\circ$, $\angle GDF = 70^\circ$, $\angle DBC = 40^\circ$ as given in the adjoining figure. Then find x , y , $\angle DCE$ and $\angle BCD$.



Q.39. Construct a histogram with a frequency polygon on the same graph from the following distribution of total marks obtained by 55 students of class IX in the final examination.

Marks	No. of Students
145-155	8
155-165	10
165-175	15
175-185	12
185-195	7
195-205	3