

HALF YEARLY EXAMINATION (2021-22)

MATHEMATICS

CLASS- IX

Time Allotted: 90Minutes

Max. Marks: 40

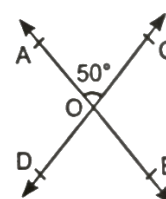
General Instructions:

1. The question paper contains three parts A, B and C.
2. Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
3. Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. There is no negative marking.

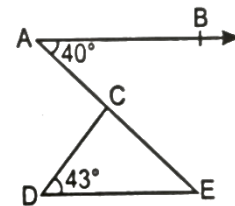
SECTION A

Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

- 1 Every rational number is 1
(A) a natural number
(B) an integer
(C) a real number
(D) a whole number
- 2 A student is asked to note down the heights of students of a class and is asked to give heading 1
for the data collected .The appropriate heading will be
(A) a primary data
(B) a secondary data
(C) frequency data
(D) raw data
- 3 Facts or figures, collected with a definite purpose are 1
(A) frequency
(B) data
(C) tally marks
(D) bars
- 4 A rational number between $\sqrt{2}$ and $\sqrt{3}$ is 1
(A) $\frac{\sqrt{2} + \sqrt{3}}{2}$
(B) (B) $\frac{\sqrt{2} - \sqrt{3}}{2}$
(C) 1.5
(D) 1.8
- 5 Point (-10, 0) lies 1
(A) On the negative direction of the x-axis
(B) On the negative direction of the y-axis
(C) In the third quadrant
(D) In the fourth quadrant
- 6 Given the class intervals 0-10, 10-20, 20-30,, then 20 is considered in class 1
(A) 10-20
(B) 20-30
(C) 10-30
(D) 15-25
- 7 In the given figure, if $\angle AOC = 50^\circ$, then $(\angle AOD + \angle COB)$ is equal to 1
(A) 100°
(B) 140°
(C) 260°
(D) 130°

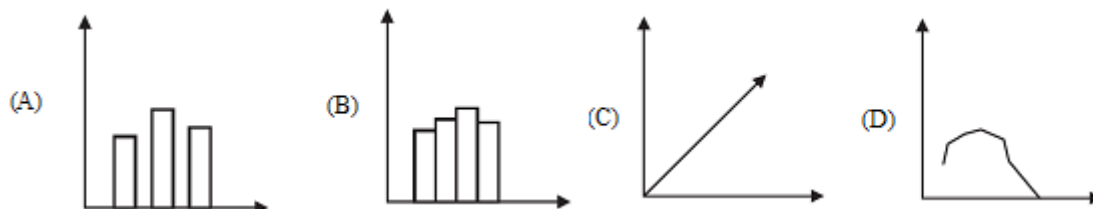


- 8 On simplifying $(\sqrt{5} + \sqrt{7})^2$, we get 1
 (A) 12
 (B) $\sqrt{35}$
 (C) $\sqrt{5} + \sqrt{7}$
 (D) $12 + 2\sqrt{35}$
- 9 If y co-ordinate of a point is 0, then this point always lies 1
 (A) In I quadrant
 (B) In II quadrant
 (C) On x-axis
 (D) On y-axis
- 10 What is common between the three angles of a triangle and a linear pair axiom? 1
 (A) Angles are equal
 (B) In both cases, sum of angles is 180°
 (C) In triangle, there are three angles and in linear pair there are two angles
 (D) None of these

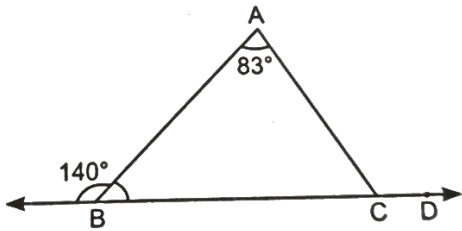


- 11 In the given figure, $AB \parallel DE$, then measure of $\angle ACD$ is 1
 (A) 43°
 (B) 40°
 (C) 83°
 (D) 97°
- 12 In triangles ABC and PQR, $AB = AC$, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are 1
 (A) Isosceles but not congruent
 (B) Isosceles and congruent
 (C) Congruent but not isosceles
 (D) Neither congruent nor isosceles
- 13 The equation of x-axis is of the form 1
 (A) $x = 0$
 (B) $y = 0$
 (C) $x + y = 0$
 (D) $x = y$

- 14 Which one of the following represents a bar graph correctly? 1



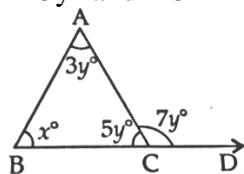
- 15 Angles of triangle are in the ratio 2:4:3. The smallest angle of the triangle is 1
 (A) 60°
 (B) 40°
 (C) 80°
 (D) 20°

- 16 The value of $\frac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}}$ is equal to 1
- (A) $\sqrt{2}$
 (B) 2
 (C) 4
 (D) 8
- 17 From the given figure, find $\angle ACD$ 1
- (A) 140°
 (B) 83°
 (C) 123°
 (D) 40°
- 
- 18 In ΔPQR , $\angle R = \angle P$, $QR = 4$ cm and $PR = 5$ cm. Then the length of PQ is 1
- (A) 4 cm (B) 5 cm (C) 2 cm (D) 2.5 cm
- 19 In histogram also we use bars and values. How it is different from bar graph? 1
- (A) No difference
 (B) Histograms are same as bars but joined together
 (C) We use class intervals instead of variables
 (D) Both (A) and (B) are correct
- 20 If p/q form of $0.\overline{38}$ is m/n , then find the value of $m + n$ 1
- (A) 137 (B) 90 (C) 140 (D) 130

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

- 21 In a morning walk, I had 20 rounds of a park. During this period, I came across person A, person B, person C and person D, 11 times, 7 times, 10 times and 5 times respectively. I want to represent this data graphically, which of the following is the best representation? 1
- (A) Bar graph
 (B) Histogram with unequal widths
 (C) Histogram with equal widths
 (D) None of these
- 22 A point both of whose coordinates are negative will lie in 1
- (A) I quadrant
 (B) II quadrant
 (C) III quadrant
 (D) IV quadrant
- 23 In the given figure, side BC of ΔABC has been produced to a point D . If $\angle A = 3y^\circ$, $\angle B = x^\circ$, $\angle C = 5y^\circ$ and $\angle CBD = 7y^\circ$ then the value of x is 1



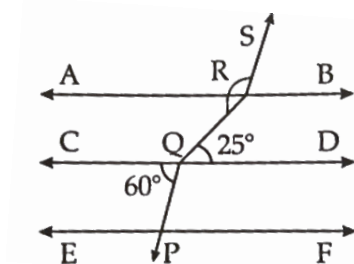
- (A) 60° (B) 50° (C) 45° (D) 35°
- 24 In ΔABC , $BC = AB$ and $\angle B = 80^\circ$. Then $\angle A$ is equal to 1
- (A) 80° (B) 40° (C) 50° (D) 100°

- 25 The range of the data: 1
 25, 18, 20, 22, 16, 6, 17, 15, 12, 30, 32, 10, 19, 8, 11, 20 is
 (A) 10 (B) 15 (C) 18 (D) 26
- 26 Which of the following is irrational? 1
 (A) 0.14 (B) $0.14\overline{16}$ (C) $0.\overline{1416}$ (D) 0.4014001400014...
- 27 If $AB = QR$, $BC = PR$ and $CA = PQ$, then 1
 (A) $\triangle ABC \cong \triangle PQR$
 (B) $\triangle CBA \cong \triangle PRQ$
 (C) $\triangle BAC \cong \triangle RPQ$
 (D) $\triangle PQR \cong \triangle BCA$
- 28 $2\sqrt{3} + \sqrt{3}$ is equal to 1
 (A) $2\sqrt{6}$ (B) 6 (C) $3\sqrt{3}$ (D) $4\sqrt{6}$
- 29 Two angles measure $a - 60^\circ$ and $123^\circ - 2a$. If each one is opposite to equal sides of an isosceles triangle, then find the value of a. 1
 (A) 61° (B) 123° (C) 70° (D) none of these
- 30 In a class of 50 students, weights of the students were taken and it was found that for 25 students, weights were of different values and other students had weights as those of the 25 values. This data can be represented well as 1
 (A) Raw data
 (B) Frequency distribution data
 (C) Grouped frequency distribution data
 (D) None of these
- 31 On plotting the points O (0, 0), A(3, 0), B (3, 4), C(0, 4) and joining OA, AB, BC and CO which of the following figure is obtained? 1
 (A) Square
 (B) Rectangle
 (C) Trapezium
 (D) Rhombus
- 32 If one angle of a triangle is equal to the sum of the other two angles, then the triangle is 1
 (A) An isosceles triangle
 (B) An obtuse triangle
 (C) An equilateral triangle
 (D) A right triangle
- 33 Which of the following is not a criterion for congruence of triangles? 1
 (A) SAS (B) ASA (C) SSA (D) SSS
- 34 $\sqrt{10} \times \sqrt{15}$ is equal to 1
 (A) $6\sqrt{5}$ (B) $5\sqrt{6}$ (C) $\sqrt{25}$ (D) $10\sqrt{5}$
- 35 The value of $(-3)^{-4}$ is 1
 (A) 12 (B) 81 (C) $\frac{-1}{12}$ (D) $\frac{1}{81}$
- 36 Which of the points P(0, 3), Q (1, 0), R (0, -1), S (-5, 0), T (1, 2) do not lie on the x-axis? 1
 (A) P and R only
 (B) Q and S only
 (C) P, R and T
 (D) Q, S and T

- 37 Choose the correct statement from the following: 1
- (A) A triangle has two right angles
 - (B) All the angles of a triangle are more than 60°
 - (C) An exterior angle of a triangle is always greater than the opposite interior angles
 - (D) All the angles of a triangle are less than 60°

- 38 In the given figure, if $AB \parallel CD \parallel EF$, $PQ \parallel RS$, $\angle RQD = 25^\circ$ and $\angle CQP = 60^\circ$, then $\angle QRS$ is equal to 1

- (A) 85° (B) 135° (C)
 145° (D) 110°

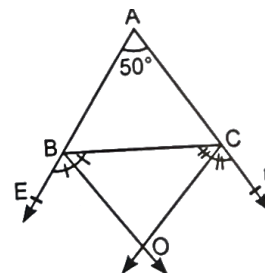


- 39 $\frac{1}{\sqrt{9}-\sqrt{8}}$ is equal to 1

- (A) $\frac{1}{2} (3 - 2\sqrt{2})$
- (B) $\frac{1}{3+2\sqrt{2}}$
- (C) $3 - 2\sqrt{2}$
- (D) $3 + 2\sqrt{2}$

- 40 In the given figure, measure of $\angle BOC$ is 1

- (A) 50°
- (B) 65°
- (C) 60°
- (D) 55°



SECTION C

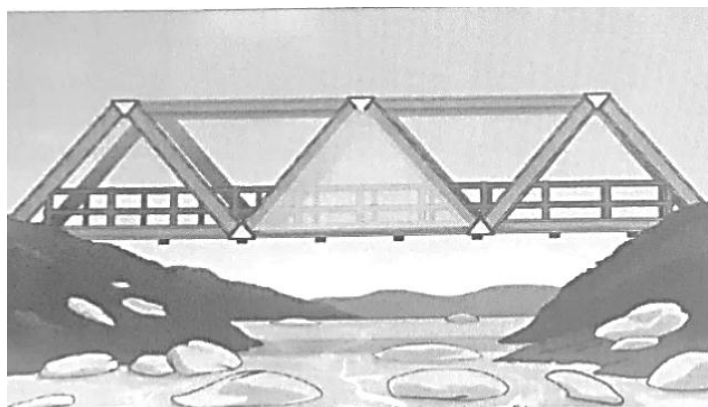
Case Study based questions:

Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.

Q41-Q45 are based on Case Study – 1

Case Study – 1

Isosceles triangles were used to construct a bridge in which the base (unequal side) of an isosceles triangle is 4 cm and its perimeter is 20 cm.



- 41 What is the length of equal sides? 1
- (A) 2 cm
 - (B) 3 cm
 - (C) 8 cm
 - (D) 10cm

- 42 What is the Heron's formula for the area of triangle? 1
- (A) $\sqrt{s(s+a)(s-b)(s-c)}$
 (B) $\sqrt{s(s+a)(s+b)(s+c)}$
 (C) $\sqrt{s(s-a)(s-b)(s-c)}$
 (D) $\sqrt{s(s.a)(s.b)(s.c)}$
- 43 What is the semi perimeter of the highlighted triangle? 1
- (A) 30 cm (B) 40 cm (C) 10 cm (D) 50 cm
- 44 What is the area of the highlighted triangle? 1
- (A) $4\sqrt{15} \text{ cm}^2$
 (B) 4 cm^2
 (C) $\sqrt{15} \text{ cm}^2$
 (D) 20 cm^2
- 45 If the sides of the triangle are in the ratio 3 : 5 : 7 and its perimeter is 300 m. Find its area. 1
- (A) $100\sqrt{2} \text{ m}^2$
 (B) $500\sqrt{2} \text{ m}^2$
 (C) $1500\sqrt{3} \text{ m}^2$
 (D) $200\sqrt{3} \text{ m}^2$

Q46-Q50 are based on Case Study – 2

Case Study – 2

Prime Minister's National Relief Fund (also called as PMNRF in short) is the fund raised to provide support for people affected by natural and man-made disasters. Natural disasters that are covered under this include flood, cyclone, earthquake etc. Man-made disasters that are included are major accidents, acid attacks, riots, etc.



सत्यमेव जयते

Prime Minister
National Relief Fund

Two friends Sita and Gita, together contributed ₹200 towards Prime Minister's Relief Fund.

- 46 Which out of the following is not the linear equation in two variables? 1
- (A) $2x + y = 3$
 (B) $4 = 5x - 4y$
 (C) $x^2 + x = 1$
 (D) $x - \sqrt{2}y = 3$
- 47 How to represent the above situation in linear equations in two variables? 1
- (A) $2x + y = 200$
 (B) $x + y = 200$
 (C) $200x = y$
 (D) $200 + x = y$

- 48 If Sita contributed ₹76, then how much was contributed by Gita? 1
(A) ₹120
(B) ₹123
(C) ₹124
(D) ₹125
- 49 If both contributed equally, then how much is contributed by each? 1
(A) ₹50, ₹150
(B) ₹100, ₹100
(C) ₹50, ₹50
(D) ₹120, ₹120
- 50 Which is the standard form of linear equation $x = -5$? 1
(A) $x + 5 = 0$
(B) $1.x - 5 = 0$
(C) $x + 0.y + 5 = 0$
(D) $1.x + 0.y = 5$