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PAPER 6
CLASS 9
MID TERM EXAMINATION

General Instructions:

Read the following instructions carefully and follow them:

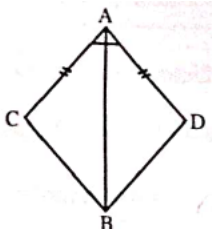
1. This question paper contains 38 questions.
2. This question paper is divided into 5 sections A, B, C, D and E.
3. In Section A, question numbers 1 to 18 are 1 mark questions 19 and 20 are Assertion – Reason based questions of 1 mark each.
4. In Section B, question numbers 21 to 25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, question numbers 26 to 31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, question numbers 32 to 35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, question numbers 36 to 38 are case study based questions carrying 4 marks each with sub part of the values 1, 1 and 2 marks each respectively.
8. All questions are compulsory. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = \frac{22}{7}$ wherever required if not stated.
11. Use of calculators is not allowed.

Section A

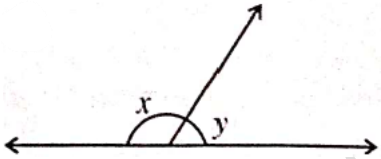
Section A consists of 20 questions of 1 mark each.

1. Write an irrational number between 0.1319 and 0.131

2. In the given figure, given two triangles are congruent, then write the corresponding names.



3. John is of the same age as Mohan. Ram is also of the same age as Mohan. State the Euclid's axiom that illustrates the relative ages of John and Ram.
4. Classify $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$ as an irrational number or a rational number. (show working)
5. The point at which the coordinate axes meet is called the _____.
6. Find the measure of an angle, if seven times its complement is $10°$ less than three times its supplement.
7. Two sides of a triangle are 13 cm and 14 cm and its semi – perimeter is 18 cm. Find the third side of this triangle.
8. In the given figure, $x - 2y = 30°$, find the value of y.



9. In $\Delta PQR, \angle R = \angle P$ and QR = 4 cm and PR = 5 cm. What is the length of PQ?
10. A point lies on the $x - axis$ at a perpendicular distance of 7 units to the left of $y - axis$. What are its coordinates?
11. The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to the base is 3 : 2. Find the length of the equal sides of the triangle.
12. Two adjacent angles on a straight line are int eh ratio 5 : 4. Find the measure of each one of these angles.
13. In $\Delta ABC, AB = AC$ and $\angle B = 50°$. Find the value of $\angle A$.
14. Give an example of two distinct irrational numbers such that their difference is a rational number.
15. Write the coordinates of a point whose ordinate is $-\frac{3}{4}$ and abscissa is 5.
16. The area of an equilateral triangle is $16\sqrt{3}\ cm^2$. Find the side of the triangle.

17. In triangles ABC and DEF, $\angle A = \angle D, \angle B = \angle E$ and AB = EF. Will the two triangles be congruent? Give reasons for your answer.
18. Find the area of an equilateral triangle with side $2\sqrt{3}\ cm$.

Directions:

19. Assertion (A): A rational number between $\frac{1}{3}$ and $\frac{1}{2}$ is $\frac{5}{12}$.

Reason (R): A rational number between two numbers a and b is $\sqrt{ab}$.

20. Assertion (A): Let OA, OB, OC and OD are rays in the anticlockwise direction such that $\angle AOB = \angle COD = 100°, \angle BOC = 82°$ and $\angle AOD = 78°$, then AOC and BOD are lines.

Reason (R): If a ray stands on a line, then the adjacent angles so formed are supplementary.

Section – B

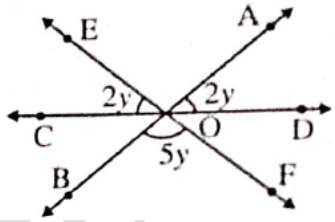
Section B consists of 5 questions of 2 marks each.

21. Simplify: $12\sqrt{18} - 6\sqrt{20} - 3\sqrt{50} + 8\sqrt{45}$.
22. If the base of a right angled triangle is 15 cm and its hypotenuse is 25 cm, then find its area.

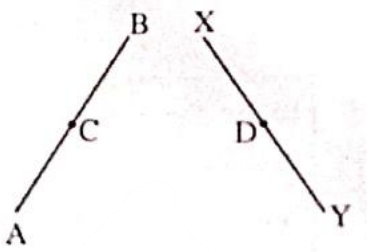
OR

The sides of a triangle are $p, p+1, 2p-1$ and its area is $2p\sqrt{10}$ sq. units. Find the value of p.

23. In the given figure, AB, CD and EF are three lines concurrent at O. Find the value of y.

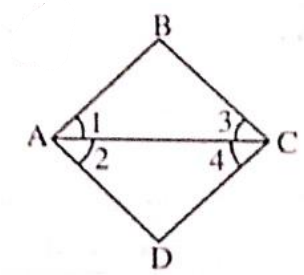


24. Express 18.484848….. in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
25. In the given figure, AC = XD, C is the midpoint of AB and D is the midpoint of XY. Using an Euclid's axiom, show that AB = XY.



OR

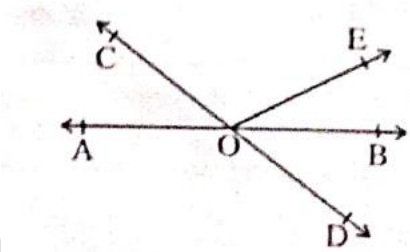
In the given figure, $\angle 1 = \angle 3$ and $\angle 2 = \angle 4$. Using Euclid's axiom, show that $\angle BAD = \angle BCD$.



Section – C

Section C consists of 6 questions of 3 marks each.

26. In the given figure, lines AB and CD intersect at O. If $\angle AOC + \angle BOE = 70°$ and $\angle BOD = 50°$, find $\angle BOE$ and reflex $\angle COE$.



27. Plot the points $A(3, 6), B(3, 2)$ and $C(8, 2)$. They are the vertices of a rectangle. Plot these points on a graph paper and then use it to find the coordinates of the vertex D. Also find the area of the rectangle so formed.

OR

Plot the points $P(1, 0), Q(4, 0)$ and $S(1, 3)$ on the graph paper. Find the coordinates of the point R such that PQRS is a square. Also find the area of the square so formed.

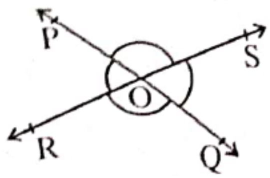
28. The sides of a rectangular plot are in the ratio 3 : 5 : 7 and its perimeter is 300 m. Find its area.

29. If $x = 2 + \sqrt{3}$, find the value of $x^2 + \frac{1}{x^2}$.

30. If two lines intersect each other, then show that the vertically opposite angles are equal.

OR

In the given figure, lines PQ and RS intersect each other at point O. If $\angle POR : \angle ROQ = 5 : 7$, find all the angles.

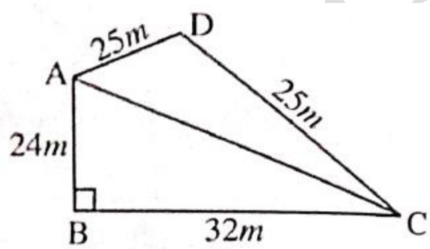


31. Prove that the angles opposite to equal sides of an isosceles triangle are equal.

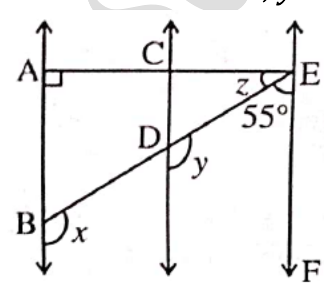
Section – D

Section D consists of 4 questions of 5 marks each.

32. Students of a school started a cleanliness campaign. They cleaned the two areas given in the figure, ΔABC and ΔADC. Which group cleaned more area and by how much?



33. In the given figure, AB || CD and CD || EF. Also EA ⊥ AB. If $\angle BEF = 55°$, find the values of x, y and z.

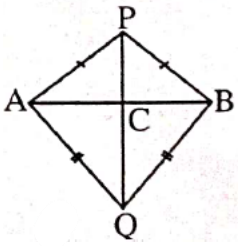


34. Simplify: $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \ldots\ldots + \frac{1}{\sqrt{8}+\sqrt{9}}$

OR

If $x = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$, then show that $x^2 + xy + y^2 = 35$.

35. AB is a line segment. P and Q are points on opposite sides of AB such that each of them is equidistant form the points A and B. Show that the line PQ is perpendicular bisector of AB.

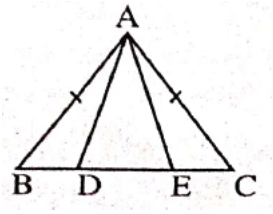


OR

In an isosceles triangle ABC with AB = AC, D and E are points on BC such that BE = CD. Show that:

(i) BD = CE

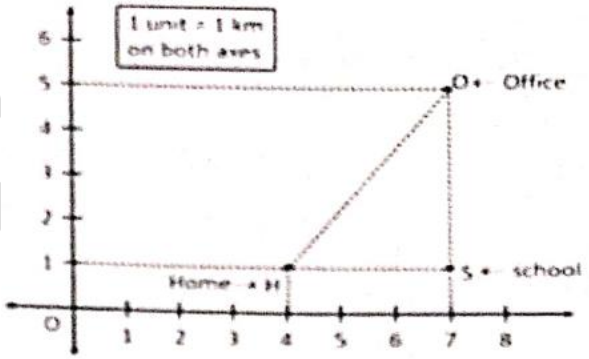
(ii) AD = AE



Section E

Case study based questions are compulsory.

36. Saumya has to reach her office every day at 10:00 a.m. On the way to her office, she drops her son at school. The location of Saumya's house, her son's school and her office are represented by the map.



Using the details given, answer the following questions:

a. How far is her son's school from her house?

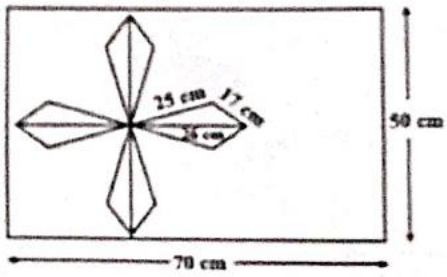
b. What is the distance between school and office?

c. What is the area of ΔHOS?

OR

Write the mirror image of H and O on $x - axis$?

37. A design is made on a rectangular tile of dimensions 50 cm × 70 cm as shown in the given figure. The design shows 8 triangles, each of sides 26 cm, 17 cm and 25 cm.



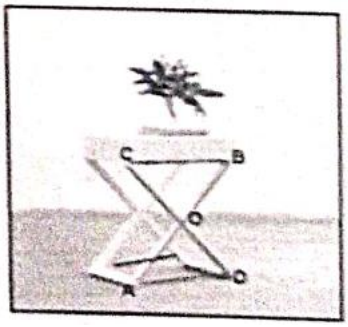
Based on the above information, answer the following questions:

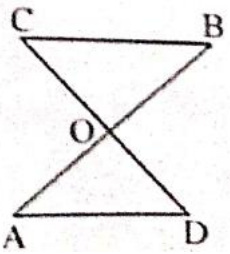
a. Find the semi – perimeter of the triangle.
b. Find the area of the triangle.
c. Find the remaining area of the tile.

OR

Find the cost of colouring all the triangular tiles at the rate of ₹ 25 per sq. cm.

38. In a 5 star hotel, there is a table to keep a flower vase, whose legs are in X – position. As shown in the figure, CB is the cross section of the top of the table. AB and DC are the two legs of the table in X shape intersecting each other at O. AD is the support fitted to the two legs at A and D to give the table the required stability. The table so made that AD || CB and BC = AD.





Based on the above information and the given figure, answer the following questions:

a. By which criterion are the triangles congruent?
b. If AB = 1.4 m, then what is the length of AO?
c. Show that $\Delta BOC \cong \Delta AOD$.

OR

Find the ratio in which point O divides both AB and CD.