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PAPER 1
CLASS 9
MID TERM EXAMINATION

General Instructions:

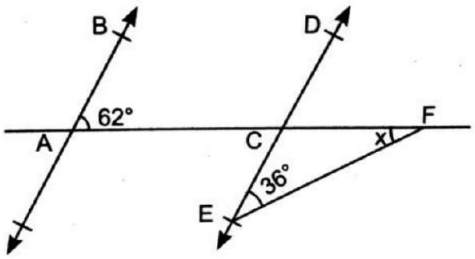
1. This question paper has 5 sections A to E.
2. Section A has 20 questions carrying 1 mark each.
3. Section B has 5 questions carrying 2 marks each.
4. Section C has 6 questions carrying 3 marks each.
5. Section D has 4 questions carrying 5 marks each.
6. Section E has 3 case based integrated units of assessment (4 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 2 marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

Section A

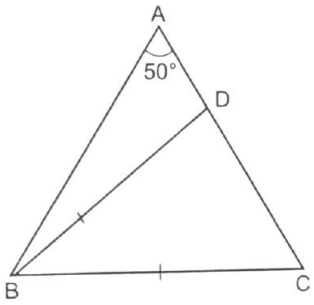
Section A consists of 20 questions of 1 mark each.

1. Let x and y be rational and irrational numbers, respectively. Is $x + y$ necessarily an irrational number? Give an example in support of your answer.
2. Abscissa of a point is positive in _____ and _____ quadrants.
3. State any one Euclid's postulates.
4. If the perimeter of an equilateral triangle is 90 cm, then find its area.
5. In a ΔABC, $\angle A + \angle B = 110°, \angle C + \angle A = 135°$, find the value of $\angle A$.
6. The perpendicular distance of the point $(-7, 2)$ from $y - axis$ is _____.
7. What is the rationalising factor of $\sqrt{3} + \sqrt{5}$?
8. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, find the greater of two angles.

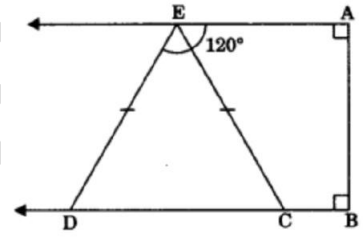
9. Find the area of an isosceles triangle having base 2 cm and the length of one of the equal sides is 4 cm.
10. In the given figure, AB || ED. Find the value of x.



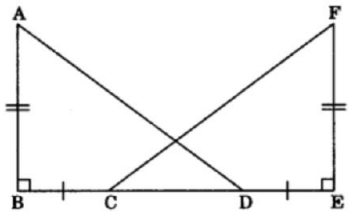
11. It is given that $\Delta ABC \cong \Delta DEF$. Is it true to say that AB = EF? Justify your answer.
12. The mirror image of the point $(3, -4)$ in $x - axis$ is _____.
13. The length of each side of an equilateral triangle whose area is $4\sqrt{3}$ sq. cm will be _____.
14. In the given figure, AB = AC and CB = BD. Then then find the value of $\angle ABD$.



15. The product of $\sqrt[3]{2}.\sqrt[4]{2}.\sqrt[12]{32}$ equals _____.
16. In the given figure, $AB \perp AE, BC \perp AB, CE = DE$ and $\angle AED = 120°$, then find the value of $\angle ECD$.



17. The hypotenuse of an isosceles right triangle is 10 cm. Find its area.
18. In figure, $AB \perp BE$ and $EF \perp BC$. If $BC = DE$ and $AB = EF$, then ΔABD is congruent to _____.



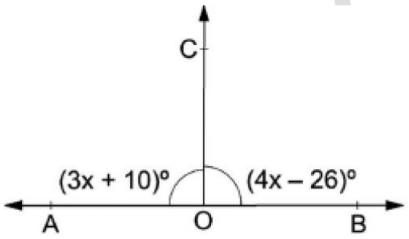
Directions: In question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).

Choose the correct option:

19. Assertion (A): The rationalising factor of $3 + 2\sqrt{5}$ is $3 - 2\sqrt{5}$.
Reason (R): If the product of two irrational numbers is rational then each one is called the rationalising factor of the other.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
b. Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).
c. Assertion (A) is true but Reason (R) is false.
d. Assertion (A) is false but Reason (R) is true.

20. Assertion (A): In the given figure, AOB is a straight line. If $\angle AOC = (3x + 10)°$ and $\angle BOC = (4x - 26)°$, then $\angle BOC = 86°$.
Reason (R): The sum of angles that are formed on a straight line is equal to 180°.

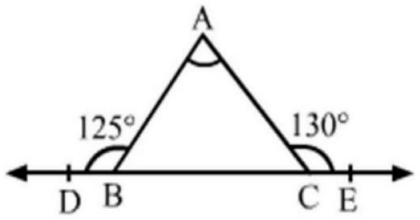


a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
b. Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).
c. Assertion (A) is true but Reason (R) is false.
d. Assertion (A) is false but Reason (R) is true.

Section – B

Section B consists of 5 questions of 2 marks each.

21. If side BC of a ΔABC has been produced to D on left and E on the right hand side of BC such that $\angle ABD = 125°$ and $\angle ACE = 130°$, then find the value of $\angle A$.

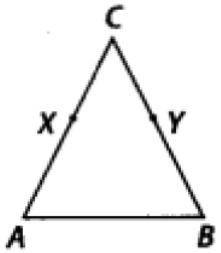


22. Find the value of $0.\overline{23} + 0.\overline{22}$

23. Mohan's maid has two children of the same age. Both of them have an equal number of dresses. Mohan on his birthday plans to give both of them the same number of dresses. What can you say about the number of dresses each one of them will have after Mohan's birthday? Which Euclid's axiom is used to answer this question?

OR

In the given figure, we have X and Y are the mid – points of AC and BC and AX = CY. Show that AC = BC.



24. If every side of a triangle is doubled, then find the percent increase in the area of the triangle so formed.

OR

The edges of a triangular board are 6 cm, 8 cm and 10 cm. Find the cost of painting it at the rate of 9 paise per cm^2.

25. Represent $\sqrt{7}$ on the number line.

Section – C

Section C consists of 6 questions of 3 marks each.

26. If $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = a + b\sqrt{15}$, find the value of a and b.

27. Plot the points $P(-2, 1), Q(2, 1), R(-2, -3)$ and $S(2, -3)$ in the Cartesian plane. Find the area of the figure obtained by joining the points.

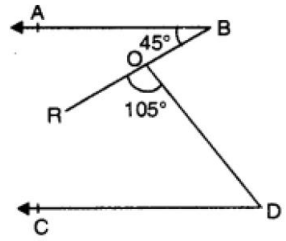
OR

Plot the point $P(3, -4)$ on a graph paper and from it draw PM and PN perpendiculars to $x - axis$ and $y - axis$ respectively. Write the coordinates of the points M and N.

28. If two parallel lines are intersected by a transversal, show that the bisectors of any corresponding angles are parallel.

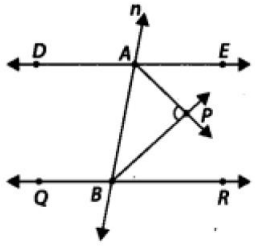
29. The perimeter of a triangular field is 144 m and its sides are in the ratio 3 : 4 : 5. Find the length of the perpendicular from the opposite vertex to the side whose length is 60 m.

30. In the given figure, if AB || CD. If $\angle ABR = 45°$ and $\angle ROD = 105°$, then find the value of $\angle ODC$.

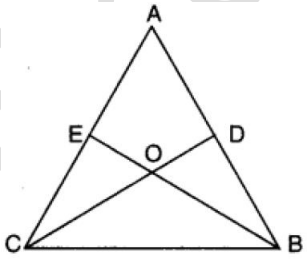


OR

In the given figure, DE || QR and AP and BP are bisectors of $\angle EAB$ and $\angle RBA$ respectively, find the value of $\angle APB$.



31. In the given figure, it is given that AE = AD and BD = CE. Prove that $\Delta AEB \cong \Delta ADC$.



Section – D

Section D consists of 4 questions of 5 marks each.

32. If $a = \frac{3+\sqrt{5}}{2}$, then find the value of $a^2 + \frac{1}{a^2}$.

OR

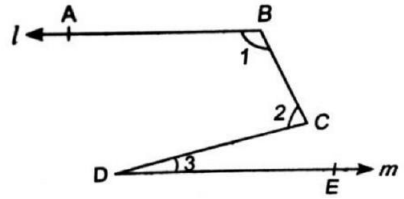
Find the value of $\frac{4}{(216)^{-\frac{2}{3}}}+\frac{1}{(256)^{-\frac{3}{4}}}+\frac{2}{(243)^{-\frac{1}{5}}}$

33. The lengths of the sides of a triangle are 7 cm, 13 cm and 12 cm. Find the length of the perpendicular from the opposite vertex to the side whose length is 12 cm.

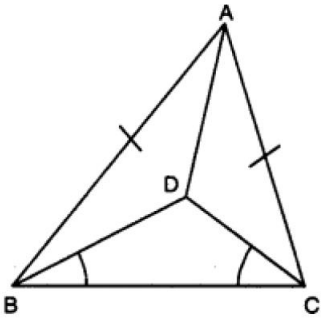
OR

A triangular park in a city has lengths of sides as 100 m, 90 m and 110 m. A contract is given to a company for planting grass in the park at the rate of ₹ 4000 per hectare. Find the amount to be paid to the company. $\left(\sqrt{2}=1.414\right)$

34. In the given figure, $l \parallel m$. Show that $\angle 1+\angle 2-\angle 3=180°$.



35. In the given figure, ABC is an isosceles triangle with AB = AC. D is a point in the interior of ΔABC such that $\angle BCD=\angle CBD$. Prove that AD bisects $\angle BAC$ of ΔABC.



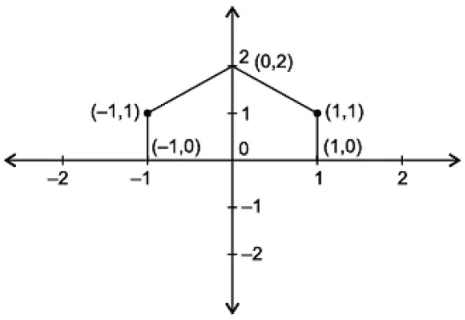
OR

Prove that if two angles of a triangle are equal, then the sides opposite to the equal angles of a triangle are of the same measure.

Section E

Case study based questions are compulsory.

36. Sohan draws a gate of a temple on the graph paper. He has following points: $(-1,0),(1,0),(1,1),(-1,1)$ and $(0,2)$.

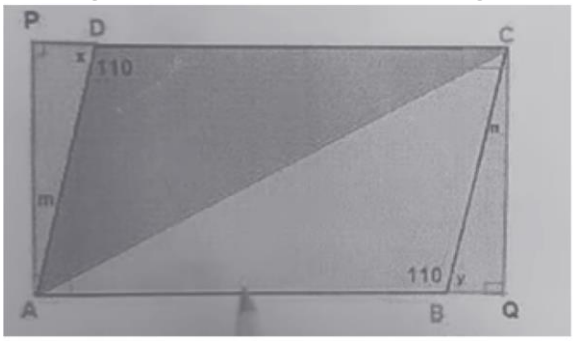


a. Abscissa of reflection of the point $(-1, 0)$ in $y - axis$ is _____.
b. Ordinate of reflection of the point $(1, 1)$ on $x - axis$ is _____.
c. Out of the given points which point lies on $y - axis$ and $x - axis$ respectively.

OR

Join origin and (1, 1), find the area of the figure obtained by the points (0, 0), (1, 1) and (1, 0).

37. Municipality converted the park ABCD into rectangular form AQCP by adding land in the form of triangle APD and triangle BCQ.

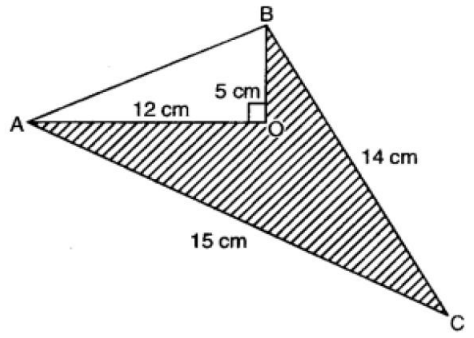


a. What is the value of x?
b. What is the value of y?
c. What is the value of m and n?

OR

Prove that $\Delta APD \cong \Delta BCQ$.

38. As a class activity showing various patterns of using triangles, Medha made a figure as shown below where triangle AOB is a right triangle.



a. Find the measure of side AB.
b. What is the semi – perimeter of ΔABC.
c. Find the area of ΔABC.

   OR

   Find the area of figure AOBC.