



UNIVERSAL EDUCATION CENTRE

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Maths, Class 9

Time allowed: 3 hours

Maximum Marks: 90

General Instructions:

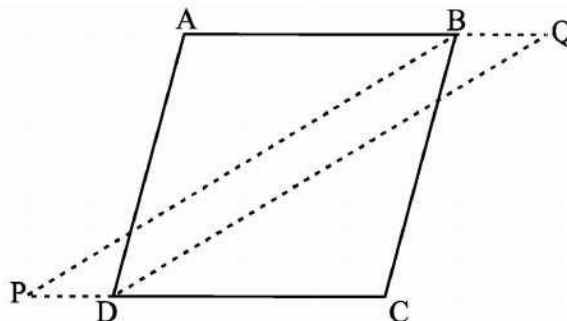
- All questions are compulsory.
- The question paper consists of 31 questions divided into five sections – A, B, C, D and E.
- Section A contains 4 questions of 1 mark each which are multiple choice questions, Section B contains 6 questions of 2 marks each, Section C contains 8 questions of 3 marks each, Section D contains 10 questions of 4 marks each and Section E contains three OTBA questions of 3 mark, 3 mark and 4 mark.
- Use of calculator is not permitted.

Section A

- Express y in terms of x in the equation $5y - 3x - 10 = 0$
(a) $y = \frac{3x-10}{5}$ (b) $y = -\frac{3x+10}{5}$ (c) $y = \frac{3x+10}{5}$ (d) $y = \frac{10x+3}{5}$
- Which of the following statement is false?
(a) If each pair of opposite sides of a quadrilateral is equal, then the quadrilateral is a parallelogram.
(b) If the sum of the consecutive interior angles of a quadrilateral is 90° , then the quadrilateral is a parallelogram
(c) If the diagonals of a quadrilateral bisect each other, then it is a parallelogram
(d) In a quadrilateral, each pair of opposite angles is equal, and then it is a parallelogram.
- The radius of a sphere is 3 cm. it is melted and recast into small spheres of radii 1 cm each. Find the number of small spheres.
(a) 27 (b) 1 (c) 9 (d) 3
- Area of an equilateral triangle of side ' a ' units can be calculated by using the formula
(a) $\sqrt{s^2(s-a)^2}$ (b) $\sqrt{s(s-a)^2}$ (c) $(s-a)\sqrt{s^2(s-a)}$ (d) $(s-a)\sqrt{s(s-a)}$

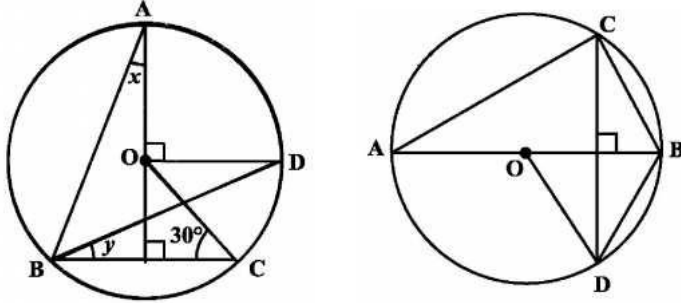
Section B

- Find a value of ' a ' so that $x = -1$ and $y = -1$ is a solution of the linear equation $9ax + 12ay = 63$
- In the below figure, bisectors of $\angle B$ and $\angle D$ of quadrilateral ABCD meet CD and AB, produced at P and Q respectively. Prove that $\angle P + \angle Q = \frac{1}{2} (\angle ABC + \angle ADC)$



- ABCD is a parallelogram. If its diagonals are equal, then find the value of $\angle ABC$?

8. Using the below figure, O is the centre of the circle, $\angle BCO = 30^\circ$, find x and y



9. Construct a triangle ABC in which $\angle B = 30^\circ$, $\angle C = 90^\circ$ and $AB + BC + CA = 11$ cm.

Or

Construct a right triangle whose base is 12 cm and sum of its hypotenuse and other side is 18 cm.

10. Write all possible outcomes when

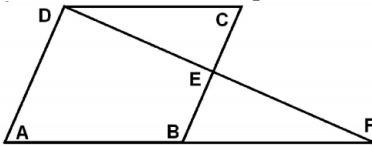
- (i) One coin is tossed (ii) Two coins are tossed (iii) One die is rolled.

Section C

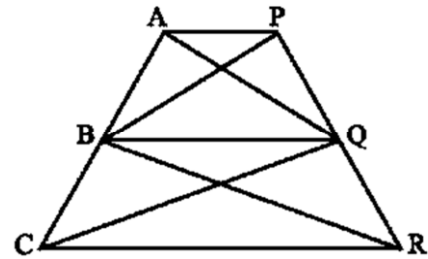
11. Solve the equation $2x + 1 = x - 3$ and represent the solution(s) on

- (i) The number line (ii) The Cartesian plane

12. In the below given figure ABCD is a parallelogram and E is the midpoint of side BC, DE and AB when produced meet at F. prove that $AF = 2B$



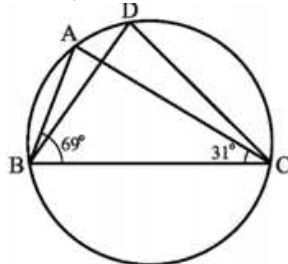
13. ABCD is a trapezium with $AB \parallel DC$. A line parallel to AC intersects AB at X and BC at Y. prove that $ar(ADX) = ar(ACY)$.



Or

The medians BE and CF of a triangle ABC intersect at G. prove that area of $\triangle GBC =$ area of quadrilateral AFGE.

14. In the below figure $\angle ABC = 69^\circ$, $\angle ACB = 31^\circ$, find $\angle BDC$



15. Construct an equilateral triangle with one of its side a 4 cm by using scale and compass.

16. Show that the diagonals of a square are equal and perpendicular to each other.

17. A hemispherical bowl of internal diameter 30 cm contains some liquid. This liquid is to be filled into cylindrical shaped bottles each of diameter 5 cm and height 6 cm. find the number of bottles necessary to empty the bowl.

18. A die is tossed 100 times and the data is recorded as below:

Outcome	1	2	3	4	5	6
Frequency	20	15	20	15	20	10

- a) What is the probability that we get an even number in a trail?
 b) What is the probability of getting a number less than 3?

Section D

19. Plot the graph of the following linear equation $2(x + 3) - 3(y + 1) = 0$. Also the following question
 (a) Write the quadrant in which the line segment intercepted between the axes lie.
 (b) Shade the triangular formed by the line and the axes.
 (c) Write the vertices of the triangle so formed.
20. A Bank gets lease a piece of land by government in the heart of city to promote his commercial advertisement. If the piece of land is in parallelogram shape of area of 120 m^2 and if equal area is divided by Bank Authority for cleaning atmosphere and commercial activity then
 (a) Evaluate the area of two equal parts
 (b) Which values promote by the bank through this activity?
21. Prove that in a triangle, the line segment joining the mid points of any two sides is parallel to third side and is half of it Using the above theorem, do the following P, Q, R are the mid-points of the sides BC, AC and AB of $\triangle ABC$ respectively. If $PQ = 2.5 \text{ cm}$, $QR = 3 \text{ cm}$, $RP = 3.5 \text{ cm}$. find the length of sides AB, BC, CA
22. In the below figure, it is given that BDEF and FDCE are parallelograms. Can you say that $BD = CD$? Why or why not-Explain

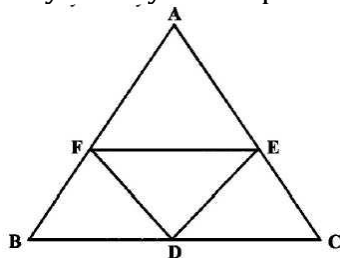


Figure (i)

Or

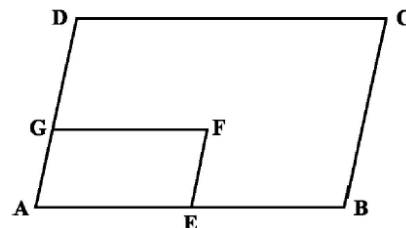
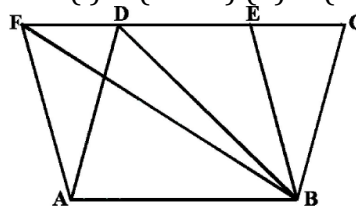


Figure (ii)

In the above figure (ii) ABCD and AEFG are two parallelograms. If $\angle C = 55^\circ$ determine $\angle F$

23. Two circles intersect at P and Q. through P two straight lines APB and CPD are drawn to meet the circles at A, B, C and D. AC and DB when produced meet at O. show that OAQB is a cyclic quadrilateral.
24. The area of the parallelogram ABCD is 90 cm^2 . Find (i) $\text{ar}(ABEF)$ (ii) $\text{ar}(ABD)$ (iii) $\text{ar}(BEF)$



25. Construct a triangle with base length 5 cm, the sum of other two sides is 7 cm and one base angle is 60°
26. A hemispherical dome of a building needs to be painted. If the circumference of the base of the dome is 17.6 m, find the cost of painting it, given the cost of painting is Rs. 5 per 100 m^2 .
27. Triangle ABC is an isosceles triangle with $AB = AC$. A circle through B and C intersect AB and AC at D and E respectively prove that $BC \parallel DE$.
28. 3 to 17 numbers are put into the box, find the probability of getting.
 (a) Greater than 6 (b) Less than equal to 17 (c) Odd numbers

Section E

29. OTBA Question for 3 marks from Statistics. Material will be supplied later.

30. OTBA Question for 3 marks from Statistics. Material will be supplied later.

31. OTBA Question for 4 marks from Statistics. Material will be supplied later.

JAYANT SIR