



UNIVERSAL EDUCATION CENTRE

JAYANT SHARMA (94145-37474 , 98181-63814)

Maths, Class 9

Time allowed: 3 hours

Maximum Marks: 90

General Instructions:

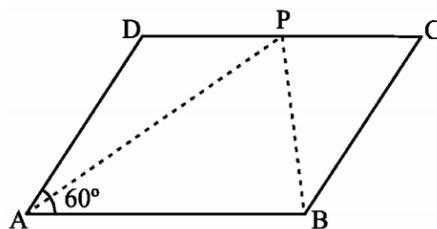
- All questions are compulsory.
- The question paper consists of 31 questions divided into five sections – A, B, C, D and E.
- Section A contains 4 questions of 1 mark each which are multiple choice questions, Section B contains 6 questions of 2 marks each, Section C contains 8 questions of 3 marks each, 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

- The numerator of a fraction is less than the denominator. Write a linear equation in two variables to represent the statement.
 (a) $x = y - 1$ (b) $x + y + 1 = 0$ (c) $x + y = 1$ (d) $x = y$
- Area of the triangle is equal to
 (a) Base X corresponding altitude (b) $\frac{1}{2}$ X Base X corresponding altitude
 (c) $\frac{1}{4}$ X Base X corresponding altitude (d) $\frac{1}{3}$ X Base X corresponding altitude
- The diameter of a roller is 84 cm and its length is 120 cm. it takes 500 complete revolution to move once over to level a playground. The area of the playground in m^2 is
 (a) 1184 (b) 1584 (c) 1284 (d) 1384
- There are 60 boys and 40 girls in a class. A student is selected at random. Find the probability that the student is a girl.
 (a) $\frac{4}{5}$ (b) $\frac{1}{5}$ (c) $\frac{2}{5}$ (d) $\frac{3}{5}$

Section B

- Draw the graph of the linear equation $3x + 4y = 6$. At what points, the graph cuts the x-axis and the y-axis.
- In the below figure ABCD is a parallelogram and $\angle DAB = 60^\circ$. If the bisector AP and BP of angles A and B respectively meet P on CD. Prove that P is the midpoint of CD.



- If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.
- P, Q, R, S are four consecutive points on a circle such that $PQ = RS$. Prove that $PR = QS$
- Construct a triangle PQR given that $QR = 3$ cm, $\angle PQR = 45^\circ$ and $QP - PR = 2$ cm.
- A die is rolled once. Find the probability of getting an odd number?

Or

Twelve defective balls are mixed with 132 good balls. It is not possible to just look at a ball and tell whether or not it is defective. One ball is taken out at random from this lot.

Determine the probability that the ball taken is a good one.

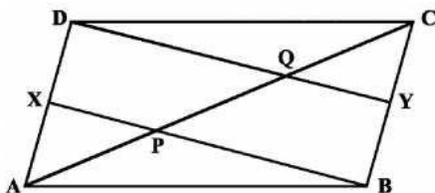
Section C

11. Give the equations of two lines passing through (2, 3). How many more such lines are there and why?

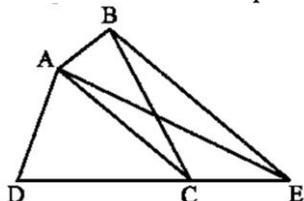
Or

Two student of your class contributed Rs. 200 together in a charity fund. Write the linear representing this data. Give some points.

12. In the below figure X and Y are respectively the mid-points of the opposite sides AD and BC of a parallelogram ABCD. Also BX and DY intersect AC at P and Q respectively. Show that $AP = PQ = QC$.

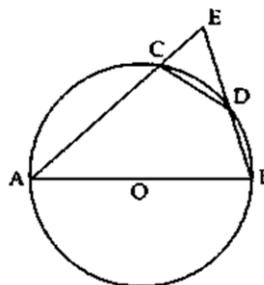


13. In the below figure ABCD is a quadrilateral and $BE \parallel AC$ and also BE meets DC produced at E. show that area of $\triangle ADE$ is equal to the area of the quadrilateral ABCD.



14. If a pair of parallel line is intersected by a transversal, show that the bisectors of a pair of alternate interior angles are also parallel.

15. In the given figure AB is a diameter of the circle; CD is a chord equal to the radius of the circle. AC and BD when extended intersect at a point E. prove that $\angle AEB = 60^\circ$.



16. The pillars of a temple are cylindrically shaped. If each pillar has a circular base of radius 20 cm and height 10 m, how much concrete mixture would be required to build 14 such pillars?
17. The radius of a spherical balloon increases from 7 cm to 14 cm as air is pumped into it. Find the ratio of surface areas of the balloon in two cases.
18. A company selected 4000 households at random and surveyed them to find out a relationship between income level and the number of television sets in a home. The information so obtained is listed in the following table:

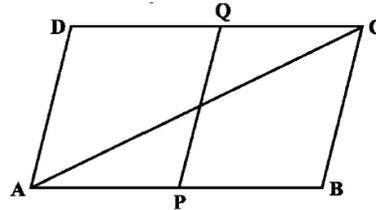
| Monthly Income (In Rs) | Number of Television/Household | | | |
|---------------------------|--------------------------------|------|-----|---------|
| | 0 | 1 | 2 | above 2 |
| < 10000 | 20 | 80 | 10 | 0 |
| 10000 - 14999 | 10 | 240 | 60 | 0 |
| 15000 - 19999 | 0 | 380 | 120 | 30 |
| 20000 - 24999 | 0 | 520 | 370 | 80 |
| 25000 and above | 0 | 1100 | 760 | 220 |

Find the probability of:

- Of a household earning Rs. 10000 – 14999 and having exactly one television.
- A household earning Rs. 25000 and more per year and owning two televisions.
- A household not having any television.

Section D

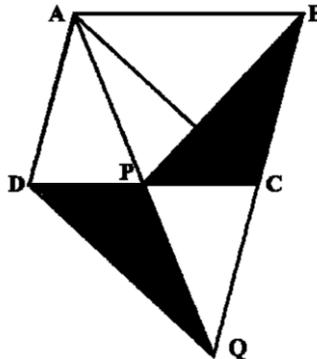
- Let the vertex of an angle ABC be located outside a circle and let the sides of the angle intersect equal chords AD and CE with the circle. Prove that $\angle ABC$ is equal to half the difference of the angles subtended by the chords AC and DE at the centre.
- A cancer detective centre is going to develop in our city of cuboid shape having 600 m, breadth 500 m and height 400 m. (a) Calculate its total area. (b) What concept derived from this activity?
- One of the two digits of a two digit number is three times the other digit. If you interchange the digits of this two-digit number and add the resulting number to the original number, you get 88. What is the original number?
- Construct a triangle with perimeter 20 cm and base angle 60° and 45° .
- Points P and Q have been taken on opposite sides AB and CD respectively of a parallelogram ABCD such that AP = CQ. Show that AC and PQ bisect each other.



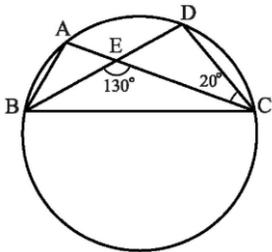
Or

Prove that the parallelogram on the same base and between the same parallels is equal area.

- A storage tank is in the form of a cube. When it is full of water, the volume of the water is 15.625 m^3 . If the present depth of the water is 1.3 m. find the volume of water already used from the tank.
- In the below figure ABCD is a parallelogram and BC is produced to a point Q such that $AD = CQ$. If AQ intersects DC at P, show that $ar(\triangle BPC) = ar(\triangle DPQ)$



26. ABCD is a quadrilateral whose diagonals AC and BD intersect at O, prove that
 (i) $AB + BC + CD + DA > AC + BD$ (ii) $AB + BC + CD + DA < 2(AC + BD)$
27. In the below figure, A, B, C and D are four points on a circle. AC and BD intersect at a point E such that $\angle BEC = 130^\circ$ and $\angle ECD = 20^\circ$. Find $\angle BAC$



28. Over the past 200 working days, the number of defective parts produced by a machine is given in the following table:

| | | | | | | | | | | | | | | |
|---------------------------|----|----|----|----|----|----|----|----|----|---|----|----|----|----|
| Number of defective parts | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Days | 50 | 32 | 22 | 18 | 12 | 12 | 10 | 10 | 10 | 8 | 6 | 6 | 2 | 2 |

Determine the probability that tomorrow's output will have

- (a) No defective part (b) At least one defective part
 (c) Not more than 5 defective parts (d) More than 13 defective parts

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.