Goa Board
Class IX Mathematics
Term II
Sample Paper - 9

Time: 3½ hrs **Total Marks: 90**

General Instructions:

1. **All** questions are **compulsory**.
2. The question paper consists of **34** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **8** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **10** questions of 3 marks each and **Section D** comprises of **10** questions of 4 marks each.
3. Question numbers **1 to 8** in **Section A** are multiple choice questions where you are to select **one** correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in **1** question of **two marks**, **3** questions of **three marks** each and **2** questions of **four marks** each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculator is **not** permitted.

(SECTION – A)

1. Class mark of the class interval 30-38 is
(A) 36
(B) 38
(C) 30
(D) 34

2. A conical tank is 6 m deep and its circular top has a radius of 1.4 m. Find the capacity of the tank.
(A) 12.32 cm^3
(B) 86.24 cm^3
(C) 21.23 cm^3
(D) 86.34 cm^3

3. The equation of the x-axis is
(A) $x + y = 0$
(B) $x - y = 0$
(C) $x = 0$
(D) $y = 0$

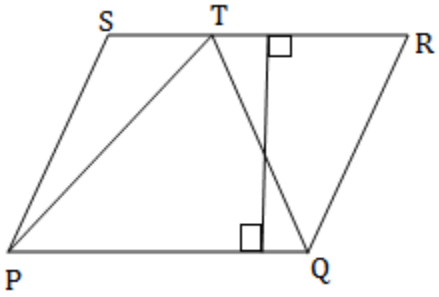
4. The relationship between the surface area of a sphere and lateral surface area of a right circular cylinder which just encloses the sphere is
(A) Surface area of the sphere is equal to the lateral surface area of the right circular cylinder.
(B) Surface area of the sphere is less than the lateral surface of the right circular cylinder.
(C) Surface area of the sphere is greater than the lateral surface area of the right circular cylinder.
(D) Lateral surface area of the sphere is less than the surface area of the right circular cylinder

5. Mode of the data set, 3, 2, 2, 2, 3, 5, 6, 6, 5, 3, 4, 2, 5, is:
(A) 3
(B) 2
(C) 5
(D) 6

6. Class marks of a frequency distribution are 6, 10, 14, 18, 22, 26, and 30. Its class size will be
(A) 4
(B) 5
(C) 9
(D) 1

7. In quadrilateral PQRS, the diagonals are equal and intersect each other at right angles. Then, quadrilateral PQRS is a
(A) Rectangle
(B) Parallelogram
(C) Rhombus
(D) Square

8. In the given figure, PQRS is a parallelogram having base PQ = 6 cm and perpendicular height is also 6 cm, then ar(ΔPTQ) is



(A) 12 cm^2
(B) 18 cm^2
(C) 6 cm^2
(D) 24 cm^2

(SECTION – B)

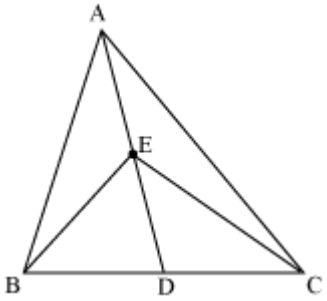
9. It is given that in a group of 3 students, the probability of 2 students not having the same birthday is 0.992. What is the probability that 2 students have the same birthday?

10. The blood groups of 30 students of Class VII are recorded as follows:

A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O, A, AB, O, A, A, O, O, AB, B, A, O, B, A, B, O

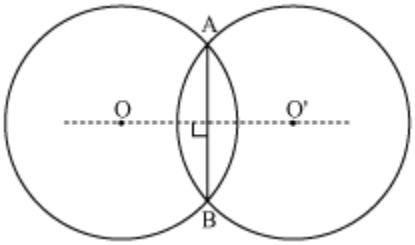
Represent this data in the form of a frequency distribution table. Which is the most common, and which is the rarest blood group among these students?

11. In the given figure, E is any point on median AD of ΔABC. Show that ar(ΔABE) = ar(ΔACE)

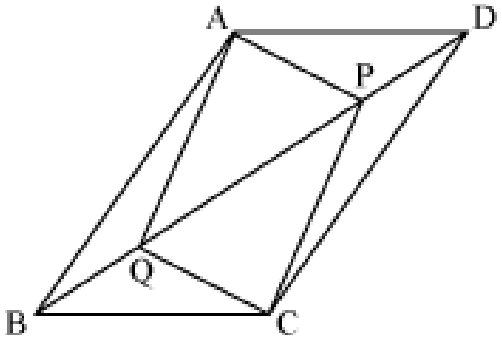


12. A kiddy bank contains hundred 50 p coins, fifty Rs. 1 coins, twenty Rs. 2 coins and ten Rs. 5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is probability that the coin
i. Will be a 50 p coin? ii. Will not be a Rs. 5 coin?

13. If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.



14. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see the given figure). Show that (i) $\Delta APD \cong \Delta CQB$ (ii) AP = CQ



(SECTION – C)

15. Neha went to a 'sale' to purchase some pants and skirts. When her friend asked her how many of each she had bought, she answered, "The number of skirts are two less than twice the number of pants purchased. Also the number of skirts is four less than four times the number of pants purchased." Help her friend to find how many pants and skirts Neha bought.

16. Sum of the digits of a two digit number is 12. If 18 is added to the original number the digits interchange their places. Write two linear equations representing these situations.

17. If a dice is rolled once, what is the probability that it will show
i. A multiple of 1? ii. A multiple of 7?

18. A sphere, a cylinder and a cone have the same radius. Find the ratio of their curved surface areas.

OR

A joker's cap is in the form of right circular cone whose base radius is 7 cm and height is 24 cm. Find the area of the sheet required to make 10 such caps.

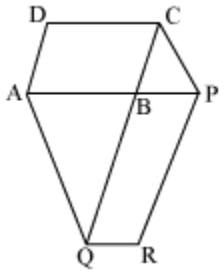
19. In a retail market, a fruit vendor was selling oranges kept in packing baskets. These baskets contained varying number of oranges. The following was the distribution of oranges:

No. of oranges	10-14	15-19	20-24	25-29	30-34
No. of baskets	15	110	135	115	25

Find the mean number of oranges kept in each basket. Which method of finding the mean did you choose?

20. If diagonals of a cyclic quadrilateral are diameters of the circle through the vertices of the quadrilateral, prove that it is a rectangle.

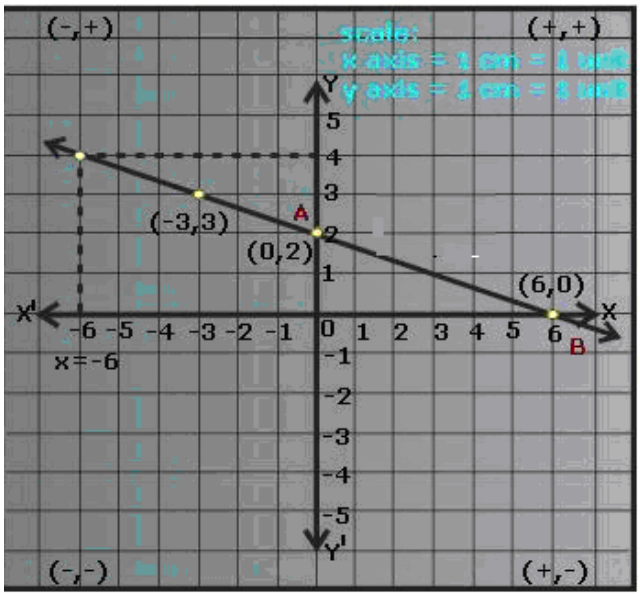
21. The side AB of a parallelogram ABCD is produced to any point P. A line through A and parallel to CP meets CB produced at Q. The parallelogram PBQR is completed (see the following figure). Show that area(ABCD) = area(PBQR).



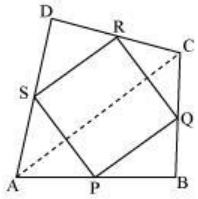
22. A village, having a population of 4000, requires 150 litres of water per head per day. It has a tank measuring 20 m × 15 m × 6 m. For how many days will the water of this tank last?

OR

Given below is the graph of the equation ax +by +c = 0. Use the graph to find
i. x when y = 0 and ii. y when x = 0



23. ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA, as shown in the given figure. AC is the diagonal. Prove that:



i. SR || AC and SR = ½ AC
ii. PQ = SR
iii. PQRS is a parallelogram.

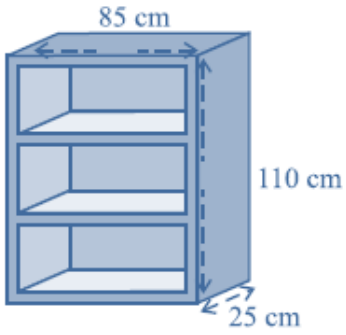
24. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears (i) A two-digit number (ii) A perfect square number (iii) A number divisible by 5.

(SECTION – D)

25. Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time at different speeds. If the cars travel in the same direction, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars?

26. Suppose you have Rs. 12000 to invest. You have to invest some amount at 10% and the rest at 15%. How much should be invested at each rate to yield 12% in the total amount invested?

27. A wooden bookshelf has external dimensions as follows: height = 110 cm, depth = 25 cm, breadth = 85 cm. The thickness of the plank is 5 cm everywhere. The external faces are to be polished and the inner faces are to be painted. If the rate of polishing is 20 paise per cm^2 and the rate of painting is 10 paise per cm^2, find the total expenses required for polishing and painting the surface of the bookshelf.



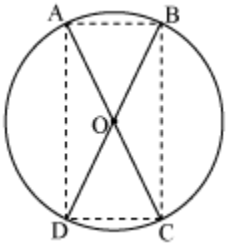
28. A dome of a building is in the form of a hemisphere. From inside, it was white-washed at the cost of Rs. 498.96. If the cost of white-washing is Rs. 2.00 per square metre, find the

i. Inner surface area of the dome
ii. Volume of air inside the dome.

29. Rahim takes out all hearts from a pack of cards. What is the probability of

i. Picking out an ace from the remaining pack.
ii. Picking out a diamonds.
iii. Picking out a card that is not a heart.
iv. Picking out the ace of hearts.

30. AC and BD are chords of a circle which bisect each other. Prove that (i) AC and BD are diameters; (ii) ABCD is a rectangle.



31. The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at distance of 4 cm from the centre, what is the distance of the other chord form the centre?

32. Construct ΔABC whose sides are 3.5 cm, 3.0 cm and 4.8 cm. Bisect the smallest angle and measure each part.

OR

Construct a triangle with base = 5 cm, sum of the other two sides = 7.7 cm and one of the angles at the base = 60°.

33. A survey was undertaken in 30 classes at a school to find the total number of left-handed students in each class. The table below shows the results:

No. of left-handed students	0	1	2	3	4	5
Frequency (no. of classes)	1	2	5	12	8	2

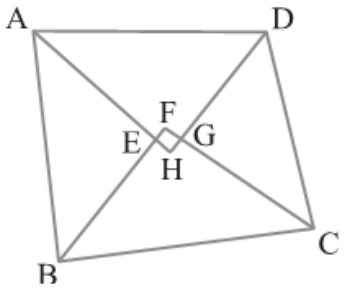
A class was selected at random.

(a) Find the probability that the class has 2 left-handed students.

(b) What is the probability that the class has at least 3 left-handed students?

(c) Given that the total number of students in the 30 classes is 960, find the probability that a student randomly chosen from these 30 classes is left-handed

34. Prove that the quadrilateral formed (if possible) by the internal angle bisectors of any quadrilateral is cyclic.



OR

Show that the diagonals of a parallelogram divide it into four triangles of equal area.