Sample/Pre-Board Paper 9

Class X Term 1 Exam Nov -Dec 2021

Mathematics (Standard) 041

Time Allowed: 90 minutes Maximum Marks: 40

General Instructions:

1. The question paper contains three parts A, B and C.
2. Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
3. Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. There is no negative marking.

SECTION A

Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

1. HCF of two numbers is 27 and their LCM is 162. If one of the numbers is 54, then the other number is

(a) 36 (b) 35

(c) 9 (d) 81

2. The pair of linear equations $2kx + 5y = 7, 6x - 5y = 11$ has a unique solution, if

(a) $k \neq -3$ (b) $k \neq \frac{2}{3}$

(c) $k \neq 5$ (d) $k \neq \frac{2}{9}$

3. The areas of two similar triangles ABC and PQR are in the ratio $9:16$. If $BC = 4.5\,\text{cm}$, then the length of QR is

(a) 4 cm (b) 4.5 cm

(c) 3 cm (d) 6 cm

4. In a rectangle $ABCD, E$ is a point on AB such that $AE = \frac{2}{3}AB$. If $AB = 6$ km and $AD = 3$ km, then length of DE. will be

(a) 2 km (b) 3 km

(c) 4 km (d) 5 km

5. If a card is selected from a deck of 52 cards, then the probability of its being a red face card is

(a) $\frac{3}{26}$ (b) $\frac{3}{13}$

(c) $\frac{2}{13}$ (d) $\frac{1}{2}$

6. A ladder 10 m long reaches a window 8 m above the ground. The distance of the foot of the ladder from the base of the wall is ..... m.

(a) 8 m (b) 2 m

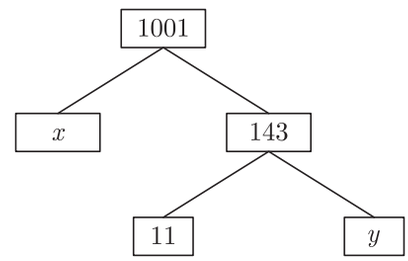
(c) 6 m (d) 4 m

7. If $\sin A = \frac{1}{2}$, then the value of $\cot A$ is

(a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$

(c) $\frac{\sqrt{3}}{2}$ (d) 1

8. The values of x and y in the given figure are



(a) 7, 13 (b) 13, 7

(c) 9, 12 (d) 12, 9

9. If the equations $kx - 2y = 3$ and $3x + y = 5$ represent two intersecting lines at unique point, then the value of k is ..... .

(a) $k = -6$ (b) $k \neq -6$

(c) $k = 4$ (d) $k \neq 4$

10. Distance of point $P(3, 4)$ from x-axis is

(a) 3 units (b) 4 units

(c) 5 units (d) 1 units

11. If one zero of the polynomial $(3x^2 + 8x + k)$ is the reciprocal of the other, then value of k is

(a) 3 (b) -3

(c) $\frac{1}{3}$ (d) $-\frac{1}{3}$

12. Which of the following is the HCF of $3^3 \times 5$ and $3^2 \times 5^2$.

(a) 15 (b) 30

(c) 45 (d) 90

13. If $\sec\theta \cdot \sin\theta = 0$, then value of θ will be

(a) 0 (b) 90^o

(c) 45^o (d) ∞

14. If $\sin A = \frac{\sqrt{3}}{2}$, the value of $2\cot^2 A - 1$ will be

(a) $\frac{1}{3}$ (b) $-\frac{1}{3}$

(c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

15. The area of the circle that can be inscribed in a square of side 6 cm is

(a) 36π cm^2 (b) 18π cm^2

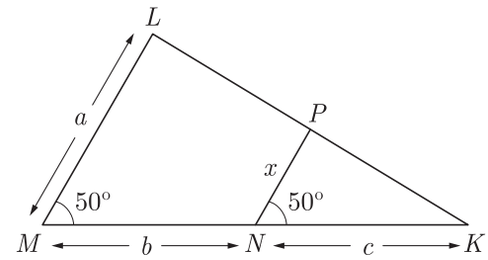
(c) 12π cm^2 (d) 9π cm^2

16. If $\Delta ABC \sim \Delta PQR$, and $\frac{AB}{PQ} = \frac{1}{3}$, then $\frac{ar(\Delta ABC)}{ar(\Delta PQR)} = ?$

(a) $\frac{1}{3}$ (b) $\frac{1}{9}$

(c) $\frac{8}{9}$ (d) $\frac{5}{9}$

17. In the given figure, the value of x is



(a) $\frac{bc}{a+c}$ (b) $\frac{ac}{b+c}$

(c) $\frac{ac}{a+b}$ (d) $\frac{bc}{a+b}$

18. If $k+1 = \sec^2\theta(1+\sin\theta)(1-\sin\theta)$, then the value of k. will be

(a) 0 (b) 1

(c) 2 (d) 15

19. For what value of p does the pair of linear equations given below has unique solution ?
$4x+py+8=0$ and $2x+2y+2=0$.

(a) $p=1$ (b) $p=2$

(c) $p \neq 4$ (d) $p \neq 2$

20. Out of one digit prime numbers, one number is selected at random. The probability of selecting an even number is

(a) $\frac{1}{3}$ (b) $\frac{1}{4}$

(c) $\frac{3}{4}$ (d) $\frac{2}{3}$

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

21. a and b are two positive integers such that the least prime factor of a is 3 and the least prime factor of b is 5. Then the least prime factor of $(a+b)$ will be

(a) 1 (b) 2

(c) 3 (d) 4

22. The mid-point of the line-segment AB is $P(0,4)$, if the coordinates of B are $(-2,\ 3)$ then the co-ordinates of A are

(a) $(2,\ 5)$ (b) $(-2,-5)$

(c) $(2,\ 9)$ (d) $(-2,11)$

23. If $1+\sin^2\theta = 3\sin\theta\cos\theta$, then $\tan\theta$ will be

(a) only 1 (b) only ½

(c) both 1 and ½ (d) only 2

24. The pair of equations $3^{x+y} = 81$, $81^{x-y} = 3$ has

(a) no solution

(b) unique solution

(c) infinitely many solutions

(d) $x = 2\frac{1}{8}, y = 1\frac{7}{8}$

25. If p and q are the zeroes of polynomial $f(x) = 2x^2 - 7x + 3$, the value of $p^2 + q^2$ will be

(a) $\frac{39}{5}$ (b) $\frac{5}{39}$

(c) $\frac{37}{4}$ (d) $\frac{4}{37}$

26. If three different coins are tossed together, then What is the probability of getting two heads?

(a) $\frac{3}{8}$ (b) $\frac{1}{4}$

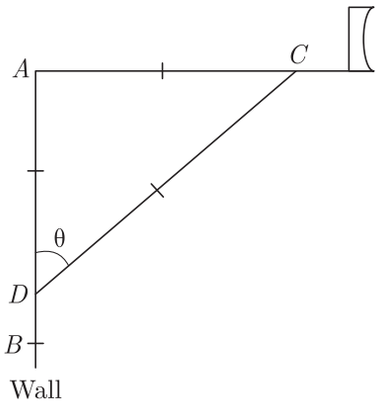
(c) $\frac{1}{2}$ (d) $\frac{5}{8}$

27. A box contains 20 cards from 1 to 20. A card is drawn at random from the box. What is the probability that the number on the drawn card is divisible by 2 or 3?

(a) $\frac{5}{20}$ (b) $\frac{3}{20}$

(c) $\frac{4}{20}$ (d) $\frac{17}{20}$

28. The rod of TV disc antenna is fixed at right angles to wall AB and a rod CD is supporting the disc as shown in Figure. If $AC = 3$ m long and $CD = 5$ m, the value of $\tan\theta$ will be



(a) 1 (b) $\frac{3}{4}$

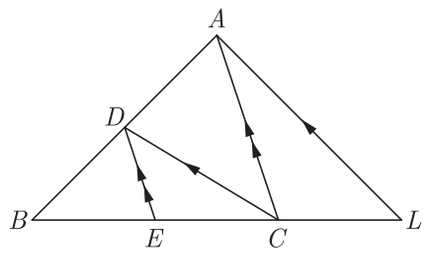
(c) $\frac{4}{5}$ (d) $\frac{3}{5}$

29. The perpendicular bisector of the line segment joining the points $A(1, 5)$ and $B(4, 6)$ cuts the y-axis at

(a) (0, 13) (b) $(0, -13)$

(c) (0, 12) (d) (13, 0)

30. In the given figure, $CD \,||\, LA$ and $DE \,||\, AC$. If $BE = 4$ cm and $EC = 2$ cm, the length of CL will be



(a) 3 cm (b) 6 cm

(c) 8 cm (d) 12 cm

31. What is the ratio is which the line segment joining the points $A(3, -3)$ and $B(-2, 7)$ is divided by x-axis.

(a) 3 : 7 (b) 4 : 7

(c) 5 : 6 (d) 4 : 6

32. If $\tan\theta = \frac{1}{\sqrt{5}}$, value of $\frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta}$ is equal to

(a) $\frac{2}{3}$ (b) $\frac{1}{3}$

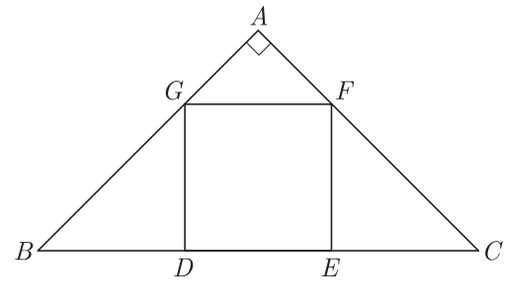
(c) $\frac{3}{4}$ (d) $\frac{1}{5}$

33. Select the smallest positive rational number by which $\frac{1}{7}$ should be multiplied so that its decimal expansion terminates after 2 places of decimal.

(a) $\frac{1}{100}$ (b) $\frac{7}{100}$

(c) $\frac{7}{10}$ (d) $\frac{1}{10}$

34. In Figure $DEFG$ is a square in a triangle ABC right angled at A.
Which of the following statement is/are correct?
(i) $\Delta AGF \sim \Delta DBG$
(ii) $\Delta AGF \sim \Delta EFC$



(a) Only (i) is correct

(b) Only (ii) is correct

(c) Both (i) and (ii) are correct.

(d) Both are wrong.

35. If (a, b) is the mid-point of the segment joining the points $A(10, -6)$ and $B(k, 4)$ and $a - 2b = 18$, the value of k will be

(a) 28 (b) 20

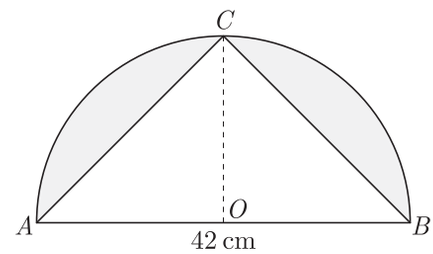
(c) 24 (d) 22

36. Two circular pieces of equal radii and maximum areas, touching each other are cut out from a rectangular cardboard of dimensions 14 cm $\times$ 7 cm. What is the area of the remaining cardboard? $\left(\text{Use } \pi = \frac{22}{7}\right)$

(a) 21π cm^2 (b) 21 cm^2

(c) 42π cm^2 (d) 42 cm^2

37. In the figure, ΔACB is in the semi-circle. What is the area of shaded region given that $AB = 42$ cm?



(a) 204 cm^2 (b) 224 cm^2

(c) 244 cm^2 (d) 252 cm^2

38. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, where $c \neq 0$, are equal, then

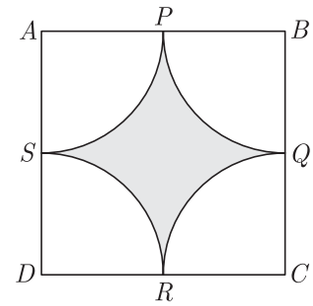
(a) c and a have opposite signs

(b) c and b have opposite signs

(c) c and a have same sign

(d) c and b have the same sign

39. In given figure arcs drawn with centres A, B, C and D intersect in pairs at midpoint P, Q, R and S of the sides AB, BC, CD and DA respectively of a square $ABCD$ of side 12 cm. What is the area of the shaded region? [Use $\pi = 3.14$]



(a) 42 cm^2 (b) 62 cm^2

(c) 31 cm^2 (d) 56 cm^2

40. Half the perimeter of a rectangular garden, whose length is 4 m more then its width, is 36 m. The dimensions of garden will be

(a) 20 m by 16 m (b) 36 m by 10 m

(c) 16 m by 30 m (d) 20 m by 16 m

SECTION C

Case study based questions:
Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

Case Based Questions: (41-45)

Ashish supplies bread and jams to a hospital and a school. Bread and jam are supplied in equal number of pieces. Bread comes in a packet of 8 pieces and Jam comes in a pack of 6 pieces.

On a particular day, Ashish has supplied x packets of bread and y packets of jam to the school. On the same day, Ashish has supplied $3x$ packets of bread along with sufficient packets of jam to hospital. It is known that the number of students in the school are between 500 and 550.

41. How many students are there in school?

(a) 544 (b) 504

(c) 608 (d) 456

42. How many packets of bread are supplied in the school?

(a) 94 (b) 63

(c) 74 (d) 84

43. How many packets of jams are supplied in the school?

(a) 129 (b) 64

(c) 74 (d) 84

44. How many packets of bread are supplied in the hospital?

(a) 189 (b) 64

(c) 74 (d) 124

45. How many packets of jams are supplied in the hospital?

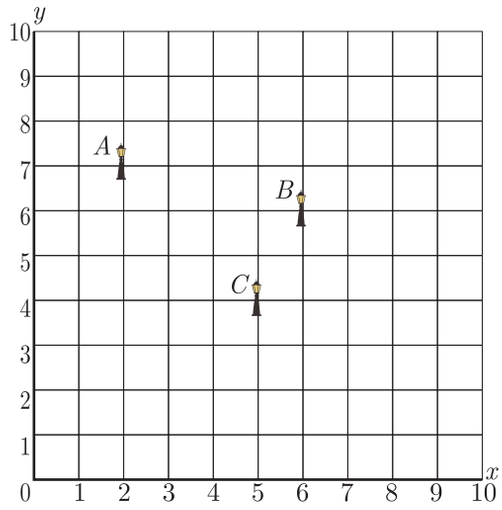
(a) 120 (b) 164

(c) 252 (d) 224

Case Based Questions: (46-50)

Resident Welfare Association (RWA) of a Gulmohar Society in Delhi have installed three electric poles A, B and C in a society's common park. Despite these three poles, some parts of the park are still in dark. So, RWA decides to have one more electric pole D in the park.

The park can be modelled as a coordinate systems given below.



On the basis of the above information, answer any four of the following questions:

46. What is the position of the pole C?

(a) (4 ,5) (b) (5, 4)

(c) (6, 5) (d) (5, 6)

47. What is the distance of the pole B from the corner O of the park ?

(a) $6\sqrt{2}$ units (b) $3\sqrt{2}$ units

(c) $6\sqrt{3}$ units (d) $3\sqrt{3}$ units

48. Find the position of the fourth pole D so that four points A, B C and D form a parallelogram .

(a) (5, 2) (b) (1, 5)

(c) (1, 4) (d) (2, 5)

49. What is the distance between poles A and C ?

(a) $6\sqrt{2}$ units (b) $3\sqrt{2}$ units

(c) $6\sqrt{3}$ units (d) $3\sqrt{3}$ units

50. What is the distance between poles B and D?

(a) $2\sqrt{3}$ units (b) $\sqrt{28}$ units

(c) $6\sqrt{3}$ units (d) $\sqrt{26}$ units

SAMPLE PAPER - 4 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(d)	Ch-1	6
2	(a)	Ch-3	10
3	(d)	Ch-4	9
4	(d)	Ch-4	46
5	(a)	Ch-8	9
6	(c)	Ch-4	21
7	(a)	Ch-6	5
8	(a)	Ch-1	16
9	(b)	Ch-3	24
10	(b)	Ch-5	8
11	(a)	Ch-2	6
12	(c)	Ch-1	S-12
13	(a)	Ch-6	36
14	(b)	Ch-6	64
15	(d)	Ch-7	6
16	(b)	Ch-4	24
17	(b)	Ch-4	66
18	(a)	Ch-6	42
19	(c)	Ch-3	35
20	(b)	Ch-8	17
21	(b)	Ch-1	29
22	(a)	Ch-5	11
23	(c)	Ch-6	70
24	(d)	Ch-3	9
25	(c)	Ch-2	38

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(a)	Ch-8	41
27	(b)	Ch-8	147
28	(b)	Ch-6	65
29	(a)	Ch-5	33
30	(a)	Ch-4	70
31	(a)	Ch-5	103
32	(a)	Ch-6	115
33	(b)	Ch-1	S-22
34	(c)	Ch-4	72
35	(d)	Ch-5	74
36	(b)	Ch-7	49
37	(d)	Ch-7	62
38	(c)	Ch-2	19
39	(c)	Ch-7	72
40	(a)	Ch-3	46
41	(b)	Ch-1	61
42	(b)	Ch-1	62
43	(d)	Ch-1	63
44	(a)	Ch-1	64
45	(c)	Ch-1	65
46	(b)	Ch-1	112
47	(a)	Ch-1	113
48	(b)	Ch-1	114
49	(b)	Ch-1	115
50	(d)	Ch-1	116

*** S- = Self Test Question**