Sample/Pre-Board Paper 33
Class X Term 1 Exam Nov -Dec 2021
Mathematics (Standard) 041

Time Allowed: 90 minutes Maximum Marks: 40
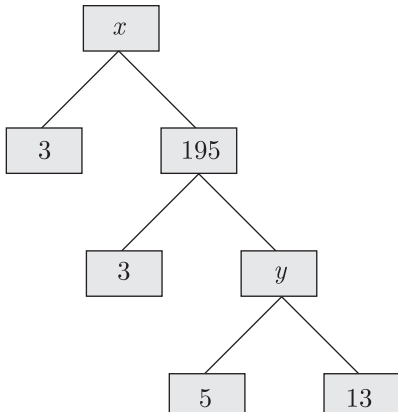
General Instructions:
1. The question paper contains three parts A, B and C.
2. Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
3. Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
4. Section C consists of 10 questions based 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. The HCF and the LCM of 12, 21, 15 are respectively
(a) 3, 140
(b) 12, 420
(c) 3, 420
(d) 420, 3

2. If a and b are the zeroes of polynomial $x^2 + ax + b$, the values of a and b are
(a) 1 and 2
(b) 1 and –2
(c) –2 and 1
(d) 2 and 1

3. ΔABC is an equilateral triangle with each side of length $2p$. If $AD \perp BC$ then the value of AD is
(a) $\sqrt{3}$
(b) $\sqrt{3}\,p$
(c) $2p$
(d) $4p$

4. The areas of two similar triangles are $81\,\text{cm}^2$ and $49\,\text{cm}^2$ respectively, then the ratio of their corresponding medians is
(a) 7 : 9
(b) 9 : 81
(c) 9 : 7
(d) 81 : 7

5. If an event cannot occur, then its probability is
(a) 1
(c) $\frac{2}{3}$
(c) $\frac{3}{4}$
(d) 0

6. The perimeters of two similar triangles ΔABC and ΔPQR are 35 cm and 45 cm respectively, then the ratio of the areas of the two triangles is ....
(a) $\frac{2}{9}$
(b) $\frac{7}{9}$
(c) $\frac{49}{81}$
(d) $\frac{3}{4}$

7. If $\sin\theta + \cos\theta = \sqrt{2}\cos\theta$, $(\theta \neq 90°)$ then the value of $\tan\theta$ is
(a) $\sqrt{2} - 1$
(b) $\sqrt{2} + 1$
(c) $\sqrt{2}$
(d) $-\sqrt{2}$

8. Which of the following will have a terminating decimal expansion?
(a) $\frac{77}{210}$
(b) $\frac{23}{30}$
(c) $\frac{125}{441}$
(d) $\frac{23}{8}$

9. For which value(s) of p, will the lines represented by the following pair of linear equations be parallel
$$3x - y - 5 = 0$$
$$6x - 2y - p = 0$$
(a) all real values except 10
(b) 10
(c) 5/2
(d) 1/2

10. The co-ordinates of the point which is reflection of point $(-3, 5)$ in x-axis are
(a) $(3, 5)$
(b) $(3, -5)$
(c) $(-3, -5)$
(d) $(-3, 5)$

11. In the given factor tree what is the composite number x?

(a) 65
(b) 585
(c) 130
(d) 195

12. The length, breadth and height of a room are 8 m 50 cm, 6 m 25 cm and 4 m 75 cm respectively. What is the length of the longest rod that can measure the dimensions of the room exactly?

(a) 10 cm 　　　　　　　(b) 25 cm

(c) 50 cm 　　　　　　　(d) 75 cm

13. $(\cos^4 A - \sin^4 A)$ is equal to

(a) $1 - 2\cos^2 A$ 　　　(b) $2\sin^2 A - 1$

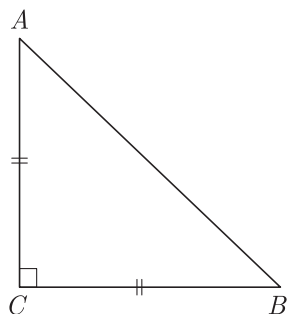(c) $\sin^2 A - \cos^2 A$ 　(d) $2\cos^2 A - 1$

14. If $x = 3\sin\theta + 4\cos\theta$ and $y = 3\cos\theta - 4\sin\theta$ then $x^2 + y^2$ is

(a) 25 　　　　　　　　(b) 45

(c) 7 　　　　　　　　(d) 49

15. If the circumferences of two concentric circles forming a ring are 88 cm and 66 cm respectively, the width of the ring will be
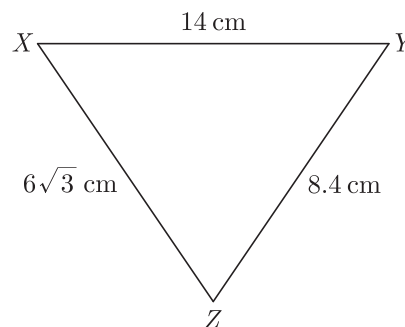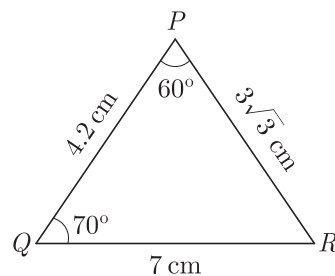
(a) 7 cm 　　　　　　　(b) 3.5 cm

(c) 7π cm 　　　　　　(d) 3π cm

16. In Figure, ABC is an isosceles triangle right angled at C with $AC = 4\,\text{cm}$, the length of AB will be

(a) $4\sqrt{3}$ 　　　　　　(b) $4\sqrt{2}$

(c) $2\sqrt{2}$ 　　　　　　(d) $3\sqrt{2}$

17. In the given figures, the measure of $\angle X$ will be

(a) $30°$ 　　　　　　　(b) $60°$

(c) $45°$ 　　　　　　　(d) $50°$

18. $\sqrt{\dfrac{1 - \sin\theta}{1 + \sin\theta}} = ?$

(a) $\sin\theta - \cos\theta$ 　　(b) $\sec\theta - \tan\theta$

(c) $\sec\theta + \tan\theta$ 　　(d) $\sin\theta + \cos\theta$

19. The pair of equations $x = a$ and $y = b$ graphically represents lines which are

(a) parallel 　　　　　　(b) intersecting at (b, a)

(c) coincident 　　　　　(d) intersecting at (a, b)

20. Someone is asked to take a number from 1 to 100. The probability that it is a prime, is

(a) $\frac{8}{25}$ 　　　　　　　(b) $\frac{1}{4}$

(c) $\frac{3}{4}$ 　　　　　　　(d) $\frac{13}{50}$

SECTION B

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

21. Tina has 39 pairs of headphones and 13 music players. Tina wants to sell all of the headphones and music players in identical packages. What is the greatest number of packages Tina can make?

(a) 4 　　　　　　　　(b) 9

(c) 13 　　　　　　　　(d) 26

22. The point which divides the line segment joining the points $(8, -9)$ and $(2, 3)$ in the ratio $1 : 2$ internally lies in the

(a) I quadrant

(b) II quadrant

(c) III quadrant

(d) IV quadrant

23. If $\sin\theta - \cos\theta = \frac{1}{2}$, the value of $\sin\theta + \cos\theta$ will be

(a) $\frac{\sqrt{2}}{3}$ (b) $\frac{\sqrt{7}}{2}$

(c) $\frac{\sqrt{5}}{3}$ (d) $\frac{\sqrt{5}}{2}$

24. If $am = bl$, then what do you say about the solution of the pair of linear equations $ax + by = c$ and $lx + my = n$?

(a) no solution   (b) unique solution

(c) infinitely solution   (d) can't say anything

25. The maximum number of zeroes a cubic polynomial can have, is

(a) 1   (b) 4

(c) 2   (d) 3

26. Which of the following relationship is the correct?

(a) $P(E) + P(\overline{E}) = 1$ (b) $P(\overline{E}) - P(E) = 1$

(c) $P(E) = 1 + P(\overline{E})$ (d) None of these

27. A card is drawn at random from a well-shuffled pack of 52 cards. What is the probability of getting a red king?

(a) $\frac{1}{13}$ (b) $\frac{1}{26}$

(c) $\frac{3}{26}$ (d) $\frac{1}{52}$

28. $\dfrac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = ?$

(a) $\tan\theta$ (b) $\sin\theta$

(c) $\cos\theta$ (d) $\sec\theta$

29. The distance of the point $P(2,3)$ from the x-axis is

(a) 2   (b) 3

(c) 1   (d) 5

30. Triangle $\triangle ABC$ is right angled at C. If p is the length of the perpendicular from C to AB and a, b, c are the lengths of the sides opposite $\angle A, \angle B$ and $\angle C$ respectively, then $\dfrac{1}{p^2}$ is equal to

(a) $\frac{a-b}{a^2+b^2}$ (b) $\frac{a+b}{a^2+b^2}$

(c) $\frac{1}{a^2} + \frac{1}{b^2}$ (d) $\frac{2ab}{a^2+b^2}$

31. If the mid-point of the line segment joining $A\left[\frac{x}{2}, \frac{y+1}{2}\right]$ and $B(x+1, y-3)$ is $C(5,-2)$, value of y is
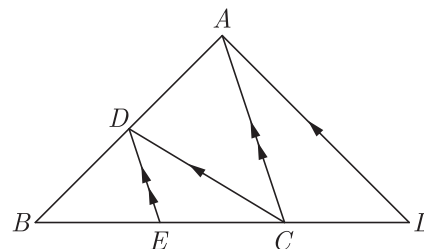
(a) –1   (b) –2

(c) –3   (d) –4

32. $\dfrac{\tan\theta}{1-\cot\theta} + \dfrac{\cot\theta}{1-\tan\theta} = ?$

(a) $1 + \tan\theta\,\text{cosec}\,\theta$ (b) $1 + \cos\theta\,\text{cosec}\,\theta$

(c) $1 + \sin\theta\,\text{cosec}\,\theta$ (d) $1 + \sec\theta\,\text{cosec}\,\theta$

33. Which of the following are the HCF and LCM of 404 and 96 ?

(a) 4 and 9696   (b) 6 and 38784

(c) 8 and 1486   (d) 6 and 9648

34. In the given figure, $CD \,||\, LA$ and $DE \,||\, AC$. If $BE = 4$ cm and $EC = 2$ cm, the length of CL will be
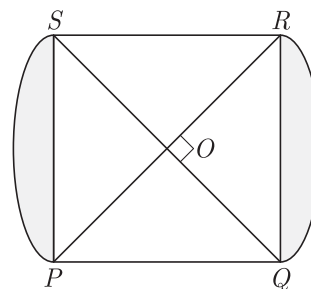
(a) 3 cm   (b) 6 cm

(c) 8 cm   (d) 12 cm

35. If the point $C(k, 4)$ divides the line segment joining two points $A(2, 6)$ and $B(5,1)$ in ratio $2 : 3$, the value of k is ....

(a) $\frac{5}{16}$ (b) $\frac{16}{5}$

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

36. In figure, $PQRS$ is square lawn with side $PQ = 42$ metre. Two circular flower beds are there on the sides PS and QR with centre at O, the intersection of its diagonals. What is the total area of the two flower beds (shaded parts)?
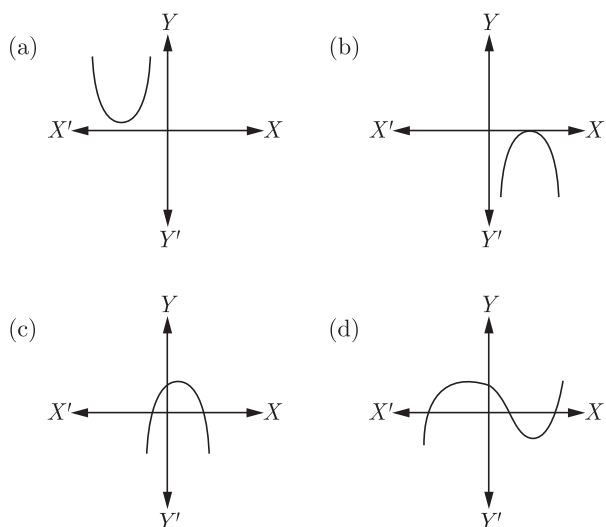
(a) 252 m^2 (b) 504 m^2

(c) 298 m^2 (d) 596 m^2

37. In the given figure, two concentric circle with centre O have radii 21 cm and 42 cm. If $\angle AOB = 60°$, what is the area of the shaded region? Use $\pi = \frac{22}{7}$.
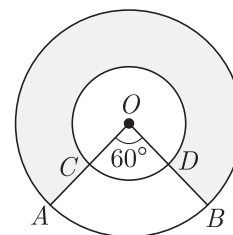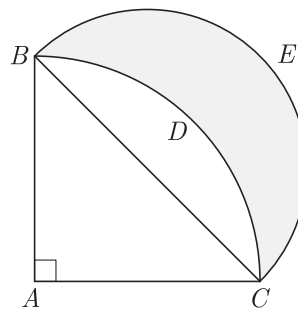
(a) 3465 cm^2 (b) 1236 cm^2

(c) 4168 cm^2 (d) 1968 cm^2

38. Which of the following is not the graph of a quadratic polynomial?

(a)

(b)

(c)

(d)

39. As $ABDC$ is a quadrant of a circle of radius 28 cm and a semi-circle BEC is drawn with BC as diameter.

What is the area of the shaded region? Use $\pi = \frac{22}{7}$.

(a) 392 cm^2

(b) 196 cm^2

(c) 208 cm^2

(d) 416 cm^2

40. For what value of k, the pair of linear equations $kx - 4y = 3$, $6x - 12y = 9$ has an infinite number of solutions ?

(a) $k = 2$

(b) $k \neq 2$

(c) $k \neq 3$

(d) $k = 4$

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)

Morning assembly is an integral part of the school's schedule. Almost all the schools conduct morning assemblies which include prayers, information of latest happenings, inspiring thoughts, speech, national anthem, etc. A good school is always particular about their morning assembly schedule. Morning assembly is important for a child's development. It is essential to understand that morning assembly is not just about standing in long queues and singing prayers or national anthem, but it's something beyond just prayers. All the activities carried out in morning assembly by the school staff and students have a great influence in every point of life. The positive effects of attending school assemblies can be felt throughout life.

Have you noticed that in school assembly you always stand in row and column and this make a coordinate system. Suppose a school have 100 students and they all assemble in prayer in 10 rows as given below.
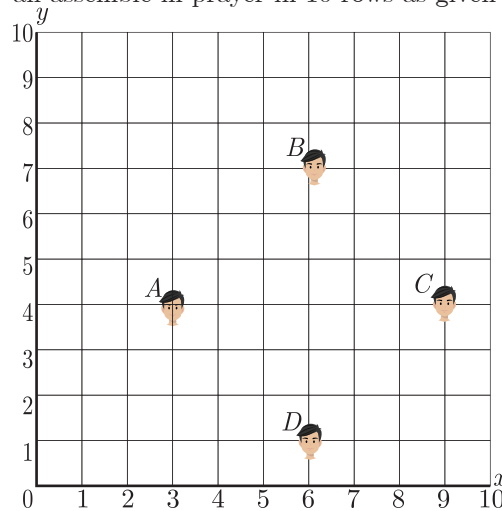
Here A, B, C and D are four friend Amar, Bharat, Colin and Dravid.

41. What is the distance between A and B ?

(a) 8

(b) 6

(c) $3\sqrt{3}$

(d) $2\sqrt{3}$

42. What is the distance between C and D ?

(a) 8

(b) 6

(c) $3\sqrt{3}$

(d) $2\sqrt{3}$

43. What is the distance between A and C ?

(a) 8   (b) 6

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

44. What is the distance between D and B ?
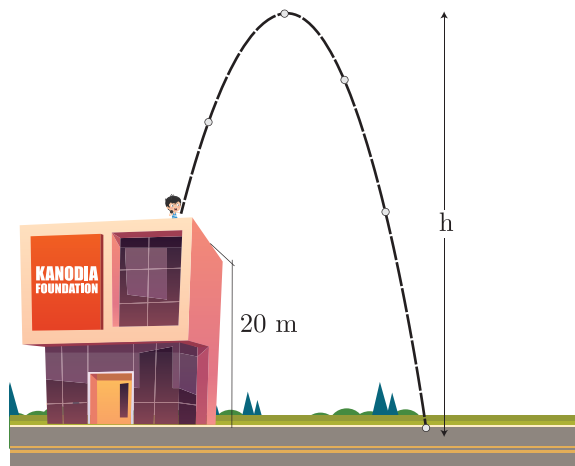
(a) 8   (b) 6

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

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

(a) 3 units   (b) 4 units

(c) 5 units   (d) 1 units

Case Based Questions: (46-50)

Lavanya throws a ball upwards, from a rooftop, which is 20 m above from ground. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time t is h, which is given by $h = -4t^2 + 16t + 20$.

20 m

46. What is the height reached by the ball after 1 second?

(a) 64 m   (b) 128 m

(c) 32 m   (d) 20 m

47. What is the maximum height reached by the ball?

(a) 54 m   (b) 44 m

(c) 36 m   (d) 18 m

48. How long will the ball take to hit the ground?

(a) 4 seconds   (b) 3 seconds

(c) 5 seconds   (d) 6 seconds

49. What are the two possible times to reach the ball at the same height of 32 m?

(a) 1 and 3 seconds   (b) 1 and 4 seconds

(c) 1 and 2 seconds   (d) 1 and 5 seconds

50. Where is the ball after 5 seconds ?

(a) at the ground   (b) rebounds

(c) at highest point   (d) fall back

SAMPLE PAPER - 28 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(c)	Ch-1	3
2	(b)	Ch-2	S-8
3	(b)	Ch-4	3
4	(c)	Ch-4	14
5	(d)	Ch-8	3
6	(c)	Ch-4	27
7	(a)	Ch-6	3
8	(d)	Ch-1	19
9	(a)	Ch-3	3
10	(c)	Ch-5	3
11	(b)	Ch-1	34
12	(b)	Ch-1	S-19
13	(d)	Ch-6	16
14	(a)	Ch-6	32
15	(b)	Ch-7	32
16	(b)	Ch-4	37
17	(d)	Ch-4	47
18	(b)	Ch-6	47
19	(d)	Ch-3	14
20	(c)	Ch-8	15
21	(c)	Ch-1	50
22	(d)	Ch-5	13
23	(b)	Ch-6	62
24	(a)	Ch-3	26
25	(d)	Ch-2	3

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(a)	Ch-8	25
27	(b)	Ch-8	35
28	(a)	Ch-6	76
29	(b)	Ch-5	24
30	(c)	Ch-4	59
31	(a)	Ch-5	48
32	(d)	Ch-6	92
33	(a)	Ch-1	S-1
34	(a)	Ch-4	70
35	(b)	Ch-5	36
36	(b)	Ch-7	79
37	(a)	Ch-7	90
38	(d)	Ch-2	21
39	(a)	Ch-7	100
40	(a)	Ch-3	36
41	(d)	Ch-5	122
42	(d)	Ch-5	123
43	(b)	Ch-5	124
44	(b)	Ch-5	125
45	(b)	Ch-5	8
46	(c)	Ch-2	94
47	(c)	Ch-2	95
48	(c)	Ch-2	96
49	(a)	Ch-2	97
50	(b)	Ch-2	98

* S- = Self Test Question