Sample/Pre-Board Paper 26
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 decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after

(a) one decimal place   (b) two decimal places

(c) three decimal places   (d) four decimal places

2. If α and β are the zeroes the polynomial $2x^2 - 4x + 5$, the value of $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$ is

(a) $\frac{4}{25}$ (b) $-\frac{4}{25}$

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

3. In the given figure, P and Q are points on the sides AB and AC respectively of a triangle ABC. PQ is parallel to BC and divides the triangle ABC into 2 parts, equal in area. The ratio of $PA : AB =$
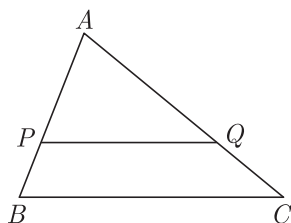
(a) $1 : 1$ (b) $(\sqrt{2} - 1) : \sqrt{2}$

(c) $1 : \sqrt{2}$ (d) $(\sqrt{2} - 1) : 1$

4. 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) $\frac{5}{9}$

5. The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs in the lot is

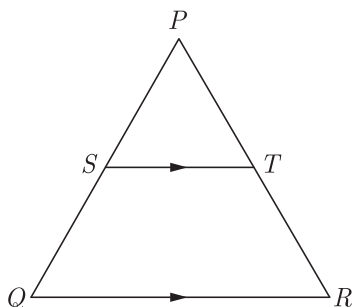(a) 7   (b) 14

(c) 21   (d) 28

6. In given figure $DE \,||\, BC$. If $AD = 3c, DB = 4c$ cm and $AE = 6$ cm then EC will be
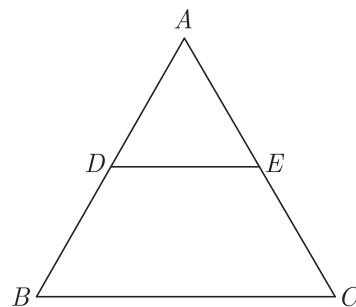
(a) 12 cm   (b) 6 cm

(c) 8 cm   (d) 10 cm

7. If $\sin\theta - \cos\theta = 0$, then the value of $(\sin^4\theta + \cos^4\theta)$ is

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

(c) $\frac{1}{2}$ (d) $\frac{1}{4}$

8. $2.\overline{35}$ is

(a) an integer   (b) a rational number

(c) an irrational number   (d) a natural number

9. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has

(a) a unique solution

(b) exactly two solutions

(c) infinitely many solutions

(d) no solution

10. If $A\left(\frac{m}{3}, 5\right)$ is the mid-point of the line segment joining the points $Q(-6,7)$ and $R(-2,3)$, then the value of m is

(a) -12 (b) -4

(c) 12   (d) -6

11. The number $3^{13} - 3^{10}$ is divisible by

(a) 2 and 3

(b) 3 and 10

(c) 2, 3 and 10

(d) 2, 3 and 13

12. Three bells toll at intervals of 9, 12, 15 minutes respectively. If they start tolling together, after what time will they next toll together?

(a) 360 minute

(b) 18 minute

(c) 36 minute

(d) 180 minute

13. The value of $\left(\sin^2\theta + \dfrac{1}{1+\tan^2\theta}\right) = $ ....

(a) 0

(b) 1

(c) 2

(d) 3

14. If $\cos A = \dfrac{2}{5}$, the value of $4 + 4\tan^2 A$ will be

(a) 1

(b) 2

(c) 4

(d) 25

15. If the radius of a circle is doubled, what about its area?

(a) Area is 2 times

(b) Area is 4 times

(c) Area is half

(d) does not change

16. In the given figure, in a triangle PQR, $ST \parallel QR$ and $\dfrac{PS}{SQ} = \dfrac{3}{5}$ and $PR = 28$ cm, the length of PT will be

17. In the given figure, if $OA \times OB = OC \times OD$, which of the option is correct ?
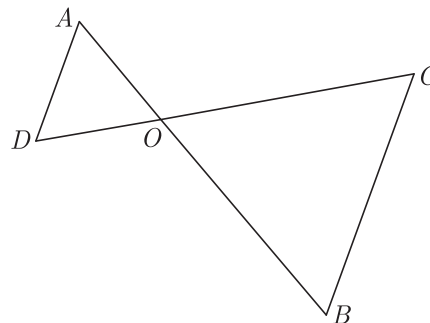
(a) $\angle A = \angle C$ and $\angle B = \angle D$

(b) $\angle A = \angle B$ and $\angle C = \angle D$

(c) $\angle A = \angle D$ and $\angle B = \angle C$

(d) Above all

(a) 21 cm

(b) 10.5 cm

(c) 15 cm

(d) 15.5 cm

18. $\dfrac{(\sin^4\theta + \cos^4\theta)}{1 - 2\sin^2\theta\cos^2\theta} = ?$

(a) 1

(b) $\sin\theta$

(c) $\tan\theta$

(d) $\cos\theta$

19. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages (in year) of the son and the father are, respectively.

(a) 4 and 24

(b) 5 and 30

(c) 6 and 36

(d) 3 and 24

20. The probability that a two digit number selected at random will be a multiple of 3 and not a multiple of 5 is

(a) $\frac{2}{15}$

(b) $\frac{4}{15}$

(c) $\frac{1}{15}$

(d) $\frac{4}{90}$

SECTION B

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

21. What is the HCF of smallest primer number and the smallest composite number?

(a) 2

(b) 4

(c) 6

(d) 8

22. If three points $(0, 0)$, $(3, \sqrt{3})$ and $(3, \lambda)$ form an equilateral triangle, then λ equals

(a) 2

(b) -3

(c) -4

(d) None of these

23. In ΔABC, $\angle B = 90^\circ$, $BC = 5$ cm, $AC - AB = 1$, What wiil be the value of $\dfrac{1+\sin C}{1+\cos C}$?

(a) $\frac{31}{36}$

(b) $\frac{25}{18}$

(c) $\frac{36}{31}$

(d) $\frac{18}{25}$

24. What do you say about the lines represented by ? $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$

(a) lines are parallel

(b) lines are coincident

(c) lines are intersecting

(d) can't say anything

25. A quadratic polynomial, whose zeroes are -3 and 4, is

(a) $x^2 - x + 12$

(b) $x^2 + x + 12$

(c) $\dfrac{x^2}{2} - \dfrac{x}{2} - 6$

(d) $2x^2 + 2x - 24$

26. On a single roll of a die, the probability of getting a number less than 7 is ....

(a) 0.5

(b) 0.4

(c) 0

(d) 1

27. Two different coins are tossed simultaneously, what is is the probability of getting at least one head?

(a) $\frac{3}{7}$

(b) $\frac{2}{7}$
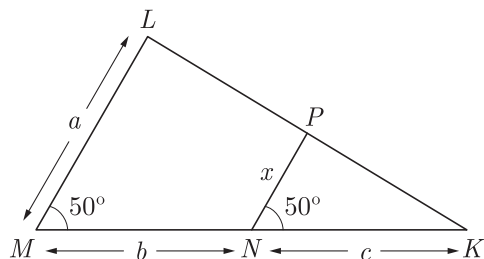
(c) $\frac{5}{7}$

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

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

(a) 1

(b) 2

(c) 3

(d) 4

29. If the point $P(2,1)$ lies on the line segment joining points $A(4,2)$ and $B(8,4)$, then

(a) $AP = \frac{1}{3} AB$

(b) $AP = PB$

(c) $PB = \frac{1}{3} AB$

(d) $AP = \frac{1}{2} AB$

30. 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) $\frac{bc}{a+b}$

31. Select the mid-point of side BC of ΔABC, with $A(1,-4)$ and the mid-points of the sides through A being $(2,-1)$ and $(0,-1)$.

(a) $(2,4)$

(b) $(4,2)$

(c) $(2,1)$

(d) $(1,2)$

32. $4(\sin^4 30^\circ + \cos^4 60^\circ) - 3(\cos^2 45 - \sin^2 90^\circ) = ?$

(a) 0

(b) 1

(c) 2

(d) 3

33. The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they change simultaneously at 7 AM, at what time will they change simultaneously again?

(a) 7 min 12 sec

(b) 8 min 12 sec

(c) 6 mni 24 sec

(d) 9 min 24 sec

34. In ΔABC, the mid-points of sides BC, CA and AB are D, E and F respectively. The ratio of $ar(\Delta DEF)$ to $ar(\Delta ABC)$ is

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

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

(c) $\frac{1}{4}$

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

35. The points $A(4,7)$, $B(p,3)$ and $C(7,3)$ are the vertices of a right triangle, right-angled at B. The value of p will be
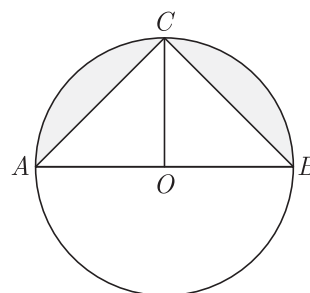
(a) 7

(b) 5

(c) 6

(d) 3

36. In given fig., O is the centre of a circle. If the area of the sector $OAPB$ is $\frac{5}{36}$ times the area of the circle, what is the value of x.
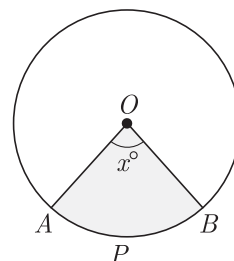
(a) 50°

(b) 60°

(c) 70°

(d) 80°

37. A round thali has 2 inbuilt triangular for serving vegetables and a separate semi-circular area for keeping rice or chapati. If radius of thali is 21 cm, what is the area of the thali that is shaded in the figure?
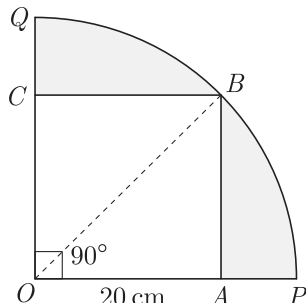

(a) 148 cm^2

(b) 296 cm^2

(c) 126 cm^2

(d) 252 cm^2

38. If -1 is a zero of the polynomial $f(x) = x^2 - 7x - 8$, then other zero is

(a) 4　　　　　　　　(b) 8

(c) 1　　　　　　　　(d) –4

39. A square $OABC$ is inscribed in a quadrant $OPBQ$ of a circle. If $OA = 20$ cm, what is the area of the shaded region. [Use $\pi = 3.14$]

(a) 148 cm^2

(b) 228 cm^2

(c) 296 cm^2

(d) 112 cm^2

40. What are the values of x and y for the following pair of linear equations ?
$$99x + 101y = 499 \text{ and } 101x + 99y = 501$$

(a) 3 and 6

(b) 3 and 2

(c) 2 and 3

(d) 6 and 3

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)

Tania is very intelligent in maths. She always try to relate the concept of maths in daily life. One day she plans to cross a river and want to know how far it is to the other side. She takes measurements on her side of the river and make the drawing as shown below.
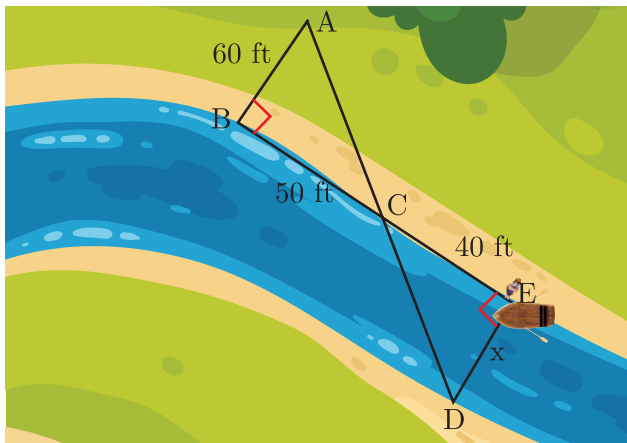
41. Which similarity criterion is used in solving the above problem ?

(a) SAS similarity criterion

(b) AA similarity criterion

(c) SSS similarity criterion

(d) None of these

42. Consider the following statement :
$$S_1 : \angle ACB = \angle DCE$$
$$S_2 : \angle BAC = \angle CDE$$

Which of the above statement is/are correct.

(a) S_1 and S_2 both　　　(b) S_1

(c) S_2　　　　　　　　　(d) None

43. Consider the following statement :
$$S_3 : \frac{AB}{DE} = \frac{CA}{CD}$$
$$S_4 : \frac{BC}{CE} = \frac{AB}{DE}$$
$$S_5 : \frac{CA}{CD} = \frac{DE}{AB}$$

Which of the above statements are correct ?

(a) S_3 and S_5　　　　　(b) S_4 and S_5

(c) S_3 and S_4　　　　　(d) All three

44. What is the distance x across the river?

(a) 96 ft

(b) 48 ft

(c) 24 ft

(d) 16 ft

45. What is the approximate length of AD shown in the figure?

(a) 120 ft

(b) 160 ft

(c) 140 ft

(d) 100 ft

Case Based Questions: (46-49)

For the box to satisfy certain requirements, its length must be three unit greater than the width, and its height must be two unit less than the width.

46. If width is taken as x, find the polynomial that represent volume of box.

(a) $6x^2 + 4x - 12$ (b) $5x^2 + 3x - 12$

(c) $x^3 + x^2 - 6x$ (d) $4x^2 + 2x + 4$

47. Find the polynomial that represent the area of paper sheet used to make box.

(a) $6x^2 + 4x - 12$ (b) $5x^2 + 3x - 12$
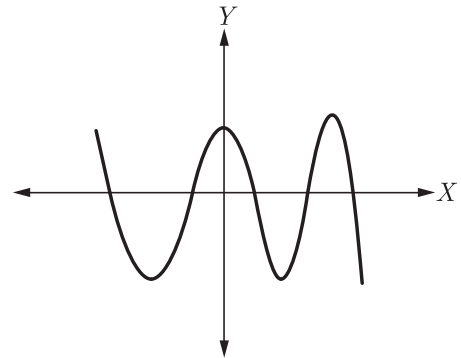
(c) $x^3 + x^2 - 6x$ (d) $4x^2 + 2x + 4$

48. If it must have a volume of 18 unit, what must be its length and height ?

(a) 6 and 1   (b) 5 and 2

(c) 6 and 2   (d) 5 and 3

49. If box is made of a paper sheet which cost is ₹ 100 per square unit, what is the cost of paper?

(a) ₹ 2100   (b) ₹ 4200

(c) ₹ 2800   (d) ₹ 5400

50. The graph of $y = p(x)$, where $p(x)$ is a polynomial in variable x, is as follows.

The number of zeroes of $p(x)$ is ....

(a) 2   (b) 3

(c) 4   (d) 5

SAMPLE PAPER - 21 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(d)	Ch-1	10
2	(b)	Ch-2	S-1
3	(c)	Ch-4	11
4	(b)	Ch-4	24
5	(b)	Ch-8	12
6	(c)	Ch-4	34
7	(c)	Ch-6	12
8	(b)	Ch-1	11
9	(d)	Ch-3	11
10	(a)	Ch-5	10
11	(d)	Ch-1	22
12	(d)	Ch-1	S-28
13	(b)	Ch-6	28
14	(d)	Ch-6	41
15	(b)	Ch-7	44
16	(b)	Ch-4	44
17	(a)	Ch-4	55
18	(a)	Ch-6	58
19	(c)	Ch-3	21
20	(b)	Ch-8	22
21	(a)	Ch-1	37
22	(d)	Ch-5	21
23	(b)	Ch-6	73
24	(b)	Ch-3	33
25	(c)	Ch-2	15

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(d)	Ch-8	32
27	(d)	Ch-8	50
28	(b)	Ch-6	85
29	(d)	Ch-5	31
30	(b)	Ch-4	66
31	(d)	Ch-5	56
32	(c)	Ch-6	100
33	(a)	Ch-1	54
34	(c)	Ch-4	79
35	(a)	Ch-5	45
36	(a)	Ch-7	45
37	(d)	Ch-7	83
38	(b)	Ch-2	33
39	(b)	Ch-7	93
40	(b)	Ch-3	43
41	(b)	Ch-4	105
42	(a)	Ch-4	106
43	(c)	Ch-4	107
44	(b)	Ch-4	108
45	(c)	Ch-4	109
46	(c)	Ch-2	47
47	(a)	Ch-2	48
48	(a)	Ch-2	49
49	(d)	Ch-2	50
50	(d)	Ch-2	27

* S- = Self Test Question