

Sample/Pre-Board Paper 10
Class X Term 1 Exam Nov -Dec 2021
Mathematics (Standard) 041

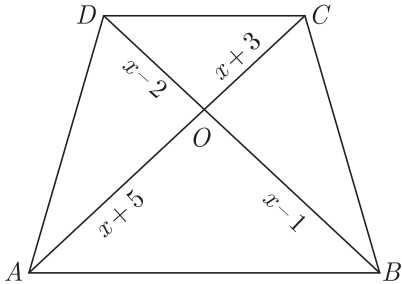
Time Allowed: 90 minutes Maximum Marks: 40

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.
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SECTION A

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

1. HCF of 144 and 198 is
(a) 9 (b) 18
(c) 6 (d) 12
2. 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
3. It is given that $\triangle ABC \sim \triangle PQR$ with $\frac{BC}{QR} = \frac{1}{4}$. Then $\frac{\text{ar}(\triangle PRQ)}{\text{ar}(\triangle BCA)}$ is equal to
(a) 16 (b) 3
(c) $\frac{1}{4}$ (d) $\frac{1}{16}$
4. In the given figure, if $AB \parallel DC$, the value of x will be

(a) 3 (b) 6
(c) 7 (d) 8
5. When a die is thrown, the probability of getting an odd number less than 3 is
(a) $\frac{1}{6}$ (b) $\frac{1}{3}$
(c) $\frac{1}{2}$ (d) 0
6. In $\triangle ABC$, $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm, then $\angle B =$
(a) 30° (b) 60°
(c) 45° (d) 90°
7. If $\sin \theta = \frac{5}{13}$, then the value of $\tan \theta$ is
(a) $\frac{5}{13}$ (b) $\frac{5}{12}$
(c) $\frac{12}{13}$ (d) $\frac{8}{13}$
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. What do you say about the solution of the pair of linear equations $y = 0$ and $y = -5$?
(a) no solution
(b) unique solution
(c) infinitely solution
(d) can't say anything
10. The distance of the point $P(-3, -4)$ from the x -axis (in units) is
(a) 3 (b) -3
(c) 4 (d) 5
11. If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kx + 1$ is -3 , then the value of k is
(a) $\frac{4}{3}$ (b) $-\frac{4}{3}$
(c) $\frac{2}{3}$ (d) $-\frac{2}{3}$

12. If HCF $(a, b) = 12$ and $a \times b = 1,800$, then LCM (a, b) will be

- (a) 300 (b) 150
(c) 450 (d) 600

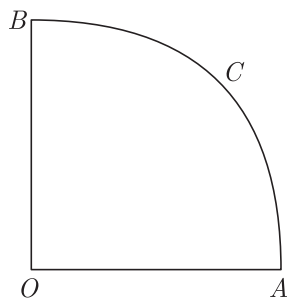
13. If $\tan(3x + 30^\circ) = 1$ then the value of x will be

- (a) 5° (b) 10°
(c) 20° (d) 30°

14. $4(\sin^4 30^\circ + \cos^4 60^\circ) - 3(\cos^2 45^\circ - \sin^2 90^\circ) = ?$

- (a) 0 (b) 1
(c) 2 (d) 3

15. In the given figure, $OACB$ is a quadrant of a circle of radius 7 cm. The perimeter of the quadrant is

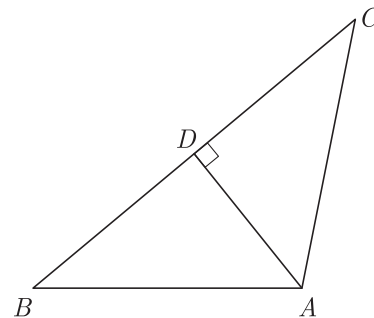


- (a) 11 cm (b) 18 cm
(c) 25 cm (d) 36 cm

16. The perimeters of two similar triangles $\triangle ABC$ and $\triangle PQR$ 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) $\frac{3}{4}$

17. In the given figure, if $AD \perp BC$, the term $AB^2 + CD^2$ is equal to



- (a) $2BD^2 + 3AC^2$ (b) $\frac{1}{2}BD^2 + AC^2$
(c) $BD^2 + \frac{1}{2}AC^2$ (d) $BD^2 + AC^2$

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

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

19. 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) $k = 4$

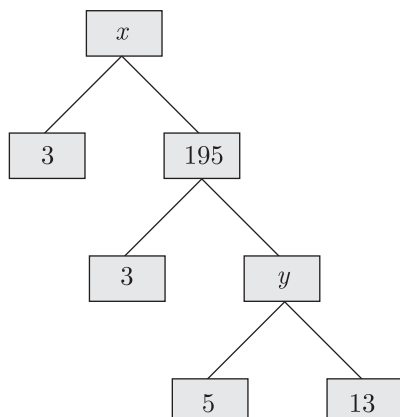
20. A bag contains 3 red and 2 blue marbles. If a marble is drawn at random, then the probability of drawing a blue marble is

- (a) $\frac{2}{5}$ (b) $\frac{1}{4}$
(c) $\frac{3}{5}$ (d) $\frac{2}{3}$

SECTION B

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

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



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

22. x -axis divides the line segment joining $A(2, -3)$ and $B(5, 6)$ in the ratio

- (a) 2 : 3 (b) 3 : 5
(c) 1 : 2 (d) 2 : 1

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

- (a) $\frac{31}{36}$ (b) $\frac{25}{18}$
(c) $\frac{36}{31}$ (d) $\frac{18}{25}$

24. Aruna has only ₹ 1 and ₹ 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹ 75, then the number of ₹ 1 and ₹ 2 coins are, respectively

- (a) 35 and 15 (b) 35 and 20
(c) 15 and 35 (d) 25 and 25

25. The zeroes of polynomial $p(x) = ax^2 + bx + c$ are reciprocal of each other if

- (a) $b = 2a$ (b) $c = b$
(c) $b = a$ (d) $c = a$

26. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball at random from the bag is three times that of a red ball, what is the number of blue balls in the bag.

- (a) 13 (b) 14
(c) 15 (d) 16

27. The probability of selecting a blue marble at random from a jar that contains only blue, black and green marbles is $\frac{1}{5}$. The probability of selecting a black marble at random from the same jar is $\frac{1}{4}$. If the jar contains 11 green marbles, what is the total number of marbles in the jar?

- (a) 20 (b) 25
(c) 30 (d) 35

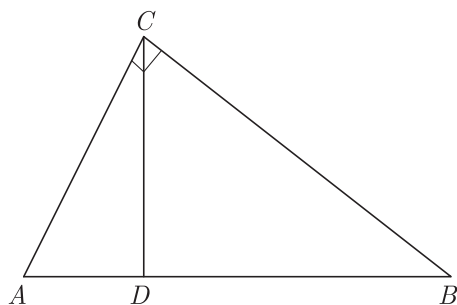
28. If $\sin \theta + \cos \theta = \sqrt{2}$ then $\tan \theta + \cot \theta = ?$

- (a) 1 (b) 2
(c) 3 (d) 4

29. If the mid-point of the line segment joining the points $A(3, 4)$ and $B(k, 6)$ is $P(x, y)$ and $x + y - 10 = 0$, the value of k will be

- (a) 4 (b) 5
(c) 6 (d) 7

30. In given figure, $\angle ACB = 90^\circ$ and $CD \perp AB$, the term CD^2 is equal to



- (a) $\frac{1}{2}BD \times AD$ (b) $BD \times AD$
(c) $\frac{1}{3}BD \times AD$ (d) $\frac{1}{4}BD \times AD$

31. The base QR of an equilateral triangle PQR lies on x-axis. The co-ordinates of point Q are $(-4, 0)$ and the origin is the mid-point of the base. The co-ordinates of the point P will be

- (a) $(0, 3\sqrt{3})$
(b) $(0, \sqrt{3})$
(c) $(0, 2\sqrt{3})$
(d) $(0, 4\sqrt{3})$

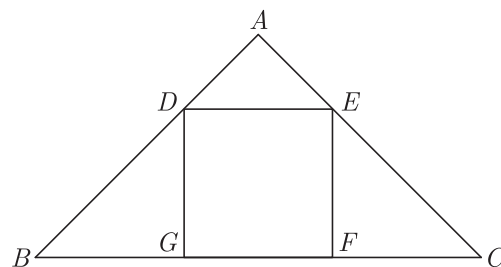
32. If $\sin \theta = \frac{c}{\sqrt{c^2 + d^2}}$ and $d > 0$, then $\tan \theta$ is equal to

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

33. What is the smallest natural number by which 1200 should be multiplied so that the square root of the product is a rational number?

- (a) 1 (b) 2
(c) 3 (d) 4

34. In the given figure, $DEFG$ is a square and $\angle BAC = 90^\circ$. The term FG^2 is equal to



- (a) $\frac{1}{3}BG \times FC$
(b) $BG \times FC$
(c) $\frac{2}{3}BG \times FC$
(d) $\frac{1}{4}BG \times FC$

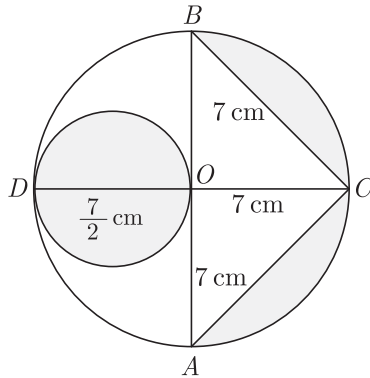
35. The point $(-3, p)$ divides the line segment joining the points $(-5, -4)$ and $(-2, 3)$. The value of p is

- (a) $\frac{2}{3}$ (b) $\frac{1}{3}$
(c) $\frac{5}{6}$ (d) $\frac{6}{5}$

36. The diameters of the front and rear wheels of a tractor are 80 cm and 200 cm respectively. What is the number of revolutions of rear wheel to cover the distance which the front wheel covers in 800 revolutions?

- (a) 320
(b) 420
(c) 820
(d) 640

37. In the given figure AB and CD are two diameters of a circle perpendicular to each other and OD is the diameter of the smaller circle. If $OA = 7$ cm, what is the area of the shaded region?



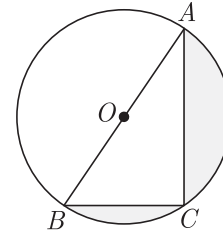
- (a) 133 cm^2 (b) 66.5 cm^2
(c) 76 cm^2 (d) 108 cm^2

38. Select the quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $f(x) = ax^2 + bx + c$, $a \neq 0$, $c \neq 0$.

- (a) $bx^2 + ax + c$ (b) $ax^2 + cx + b$

- (c) $cx^2 + bx + a$ (d) $bx^2 + cx + a$

39. In the given figure, O is the centre of circle such that diameter $AB = 13$ cm and $AC = 12$ cm. BC is joined. What is the area of the shaded region. ($\pi = 3.14$)



- (a) 28.4 cm^2 (b) 42.4 cm^2
(c) 36.3 cm^2 (d) 52.4 cm^2

40. Sum of the ages of a father and the son is 40 years. If father's age is three times that of his son, then what is father age ?

- (a) 22 years (b) 28 years
(c) 30 years (d) 24 years

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)

Shalvi is a tuition teacher and teaches mathematics to some kids at her home. She is very innovative and always plan new games to make her students learn concepts.



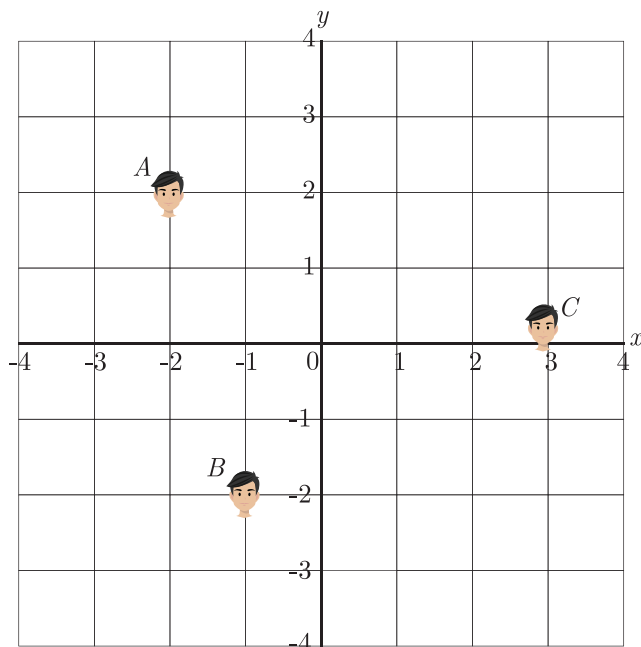
Today, she has planned a prime number game. She announce the number 2 in her class and asked the first student to multiply it by a prime number and then pass it to second student. Second student also multiplied it by a prime number and passed it to third student. In this way by multiplying to a prime number the last student got 173250. He told this number to

Shalvi in class. Now she asked some questions to the students as given below.

41. How many students are in the class?
(a) 6 (b) 7
(c) 8 (d) 9
42. What is the highest prime number used by student?
(a) 2 (b) 3
(c) 5 (d) 11
43. What is the least prime number used by students ?
(a) 2 (b) 3
(c) 5 (d) 11
44. Which prime number has been used maximum times ?
(a) 2 (b) 3
(c) 5 (d) 11
45. Which prime number has been used minimum times ?
(a) 2 (b) 3
(c) 7 (d) 11

Case Based Questions: (46-50)

Ajay, Bhigu and Colin are fast friend since childhood. They always want to sit in a row in the classroom . But teacher doesn't allow them and rotate the seats row-wise everyday. Bhigu is very good in maths and he does distance calculation everyday. He consider the centre of class as origin and marks their position on a paper in a co-ordinate system. One day Bhigu make the following diagram of their seating position.



46. What are the coordinates of point A?

- (a) $(2, 2)$ (b) $(2, -2)$
(c) $(-2, 2)$ (d) $(-2, -2)$

47. What is the distance of point A from origin ?

- (a) 8 (b) $2\sqrt{2}$
(c) 4 (d) $4\sqrt{2}$

48. What is the distance between A and B ?

- (a) $3\sqrt{19}$ (b) $3\sqrt{5}$
(c) $\sqrt{17}$ (d) $2\sqrt{5}$

49. What is the distance between B and C ?

- (a) $3\sqrt{19}$ (b) $3\sqrt{5}$
(c) $2\sqrt{17}$ (d) $2\sqrt{5}$

50. A point D lies on the line segment between points A and B such that $AD:DB = 4:3$. What are the coordinates of point D ?

- (a) $(\frac{10}{7}, \frac{2}{7})$ (b) $(\frac{2}{7}, \frac{7}{7})$
(c) $(-\frac{10}{7}, -\frac{2}{7})$ (d) $(-\frac{2}{7}, -\frac{7}{7})$

SAMPLE PAPER - 5 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(b)	Ch-1	7
2	(d)	Ch-3	11
3	(a)	Ch-4	12
4	(c)	Ch-4	56
5	(a)	Ch-8	11
6	(d)	Ch-4	22
7	(b)	Ch-6	24
8	(d)	Ch-1	19
9	(a)	Ch-3	25
10	(c)	Ch-5	9
11	(a)	Ch-2	14
12	(b)	Ch-1	S-13
13	(a)	Ch-6	38
14	(c)	Ch-6	100
15	(c)	Ch-7	9
16	(c)	Ch-4	27
17	(d)	Ch-4	69
18	(b)	Ch-6	47
19	(a)	Ch-3	36
20	(b)	Ch-8	18
21	(b)	Ch-1	34
22	(c)	Ch-5	12
23	(b)	Ch-6	73
24	(d)	Ch-3	20
25	(d)	Ch-2	39

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(c)	Ch-8	45
27	(a)	Ch-8	139
28	(b)	Ch-6	68
29	(d)	Ch-5	40
30	(b)	Ch-4	76
31	(d)	Ch-5	100
32	(b)	Ch-6	114
33	(c)	Ch-1	S-21
34	(b)	Ch-4	71
35	(a)	Ch-5	69
36	(a)	Ch-7	50
37	(b)	Ch-7	63
38	(c)	Ch-2	41
39	(c)	Ch-7	73
40	(c)	Ch-3	49
41	(c)	Ch-1	66
42	(d)	Ch-1	67
43	(b)	Ch-1	68
44	(c)	Ch-1	69
45	(c)	Ch-1	70
46	(c)	Ch-1	117
47	(b)	Ch-1	118
48	(c)	Ch-1	119
49	(d)	Ch-1	120
50	(c)	Ch-1	121

* S- = Self Test Question