

Sample/Pre-Board Paper 19
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.

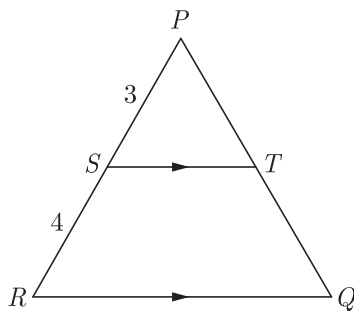
1. HCF of 144 and 198 is

- (a) 9 (b) 18
(c) 6 (d) 12

2. Which of the following value of k should be selected so that the pair of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has a unique solution ?

- (a) $k \neq 5$ (b) $k \neq 6$
(c) $k = 5$ (d) $k = 6$

3. In the given figure, $ST \parallel RQ$, $PS = 3$ cm and $SR = 4$ cm. What is the ratio of the area of ΔPST to the area of ΔPRQ ?



- (a) 9 : 7 (b) 16 : 49
(c) 8 : 36 (d) 9 : 49

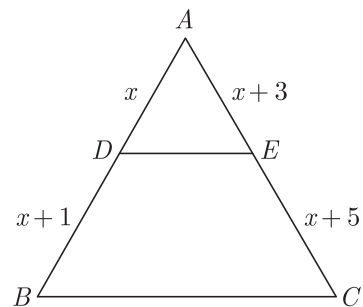
4. In an equilateral triangle of side 24 cm, the length of the altitude will be

- (a) $8\sqrt{2}$ (b) $8\sqrt{3}$
(c) $12\sqrt{2}$ (d) $12\sqrt{3}$

5. The $P(A)$ denotes the probability of an event A , then

- (a) $P(A) < 0$ (b) $P(A) > 1$
(c) $0 \leq P(A) \leq 1$ (d) $-1 \leq P(A) \leq 1$

6. In ΔABC , $DE \parallel BC$, the value of x will be



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

7. Given that $\sin \alpha = \frac{\sqrt{3}}{2}$ and $\cos \beta = 0$, then the value of $\beta - \alpha$ is

- (a) 0° (b) 90°
(c) 60° (d) 30°

8. The decimal expansion of $\frac{23}{2^7 \times 5^2}$ will terminate after how many places of decimal?

- (a) 2 (b) 4
(c) 5 (d) 1

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

- (a) lines are parallel
(b) lines are coincident
(c) lines are intersecting
(d) can't say anything

10. If $\tan A = \cot B$, then the value of $(A + B)$ is

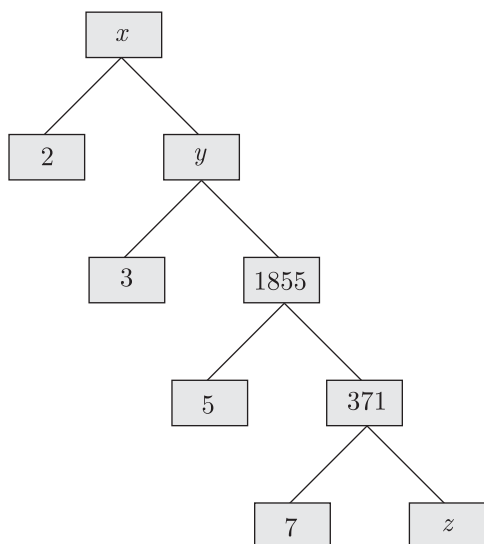
- (a) 90° (b) 120°
(c) 60° (d) 180°

11. 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
12. If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$; where a, b being prime numbers, then LCM (p, q) is equal to
 (a) ab (b) a^2b^2
 (c) a^3b^2 (d) a^3b^3
13. If $\tan A = \cot B$, then the value of $(A + B)$ is
 (a) 90° (b) 120°
 (c) 60° (d) 180°
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. A race track is in the form of a ring whose inner and outer circumference are 437 m and 503 m respectively. The area of the track is
 (a) 66 sq. cm. (b) 4935 sq. cm.
 (c) 9870 sq. cm (d) None of these
16. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, then the corresponding side of second triangle is
 (a) 4.2 cm (b) 5.4 cm
 (c) 20 cm (d) 6 cm
17. Triangle ABC is an isosceles triangle in which $AB = AC = 10$ cm $BC = 12$ cm. A rectangle $PQRS$ is inside the isosceles triangle. Given $PQ = SR = y$, $PS = PR = 2x$. The value of x is
 (a) $3 - \frac{1}{4}y$ (b) $3 - \frac{3}{4}y$
 (c) $6 - \frac{1}{4}y$ (d) $6 - \frac{3}{4}y$
18. $\frac{\sin \theta}{\cot \theta + \operatorname{cosec} \theta} = ?$
 (a) $1 - \cos \theta$ (b) $1 + \cos \theta$
 (c) $1 + \sin \theta$ (d) $1 - \sin \theta$
19. Given the linear equation $3x + 4y = 9$. Select another linear equation in these two variables such that the geometrical representation of the pair so formed is coincident lines.
 (a) $3x - 5y = 10$ (b) $6x + 8y = 18$
 (c) $8x + 12y = 18$ (d) above all
20. If the probability of winning a game is $\frac{5}{11}$, what is the probability of losing the game?
 (a) $\frac{7}{11}$ (b) $\frac{3}{11}$
 (c) $\frac{1}{11}$ (d) $\frac{6}{11}$

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) 53 (b) 11130
 (c) 5565 (d) 19438

22. 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

23. $\sqrt{\frac{1 - \cos A}{1 + \cos A}} = ?$

- (a) $1 + \cos A$
 (b) $\operatorname{cosec} A + \cot A$
 (c) $\operatorname{cosec} A - \cot A$
 (d) $1 - \cos A$

24. The area of a rectangle gets reduced by 9 square units, if its length is reduced by 5 units and the breadth is increased by 3 units. The area is increased by 67 square units if length is increased by 3 units and breadth is increased by 2 units. The perimeter of the rectangle will be

(a) 52 units (b) 58 units
(c) 46 units (d) 48 units

25. If zeroes of the polynomial $x^2 + 4x + 2a$ are a and $\frac{2}{a}$, then the value of a is

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

26. A box contains 90 discs which are numbered 1 to 90. If one disc is drawn at random from the box, what is the probability that it bears number divisible by 5.

(a) $\frac{1}{5}$ (b) $\frac{1}{9}$
(c) $\frac{11}{90}$ (d) $\frac{8}{90}$

27. One card is drawn from a well-shuffled deck of 52 cards. What is the probability of getting either a king or a black cards?

(a) $\frac{7}{13}$ (b) $\frac{3}{26}$
(c) $\frac{23}{52}$ (d) $\frac{7}{26}$

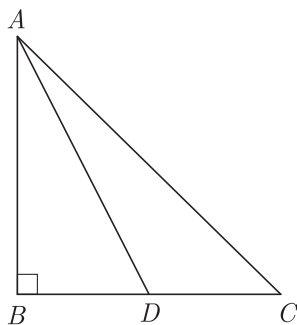
28. $\frac{\cos \theta - \sin \theta + 1}{\cos \theta + \sin \theta - 1} = ?$

(a) $\cos \theta - \sin \theta$ (b) $\sin \theta - \cos \theta$
(c) $\sin \theta + \cos \theta$ (d) $\operatorname{cosec} \theta + \cot \theta$

29. The perpendicular distance of $A(5, 12)$ from the y-axis will be

(a) 6 (b) 3
(c) 4 (d) 5

30. In the given figure, ABC is a right angled triangle, $\angle B = 90^\circ$. If D is the mid-point of BC , then AC^2 equal to



(a) $3AD^2 + CD^2$ (b) $AD^2 + 3CD^2$
(c) $3AD^2 + \frac{1}{3}CD^2$ (d) $\frac{1}{3}AD^2 + 3CD^2$

31. What are the co-ordinates of the points which divide the line segment joining the points $(5, 7)$ and $(8, 10)$ in 3 equal parts?

(a) $P(6, 8)$ and $Q(7, 9)$
(b) $P(8, 6)$ and $Q(9, 7)$
(c) $P(6, 8)$ and $Q(9, 7)$
(d) $P(8, 6)$ and $Q(7, 9)$

32. $\frac{1}{\operatorname{cosec} A - \cot A} + \frac{1}{\operatorname{cosec} A + \cot A} = ?$

(a) $\frac{2}{\sin A}$ (b) $\frac{1}{\sin A}$
(c) $\frac{1}{\cos A}$ (d) $\frac{2}{\cos A}$

33. Jasmin is completing an art project. She has two pieces of construction paper. The first piece is 44 centimeters wide and the second piece is 33 centimeters wide. Jasmin wants to cut the paper into strips that are equal in width and are as wide as possible. How wide should Jasmin cut each strip?



(a) 10 cm (b) 11 cm
(c) 22 cm (d) 33 cm

34. The length BR is

(a) 15 cm (b) 25 cm
(c) 12 cm (d) 9 cm

35. What is the distance between the two flags?

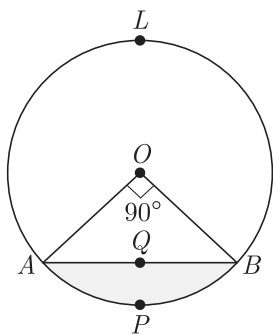
(a) $\sqrt{61}$ m (b) $\sqrt{125}$ m
(c) $\sqrt{42}$ m (d) $\sqrt{142}$ m

36. A piece of wire 22 cm long is bent into the form an arc of a circle subtending an angle of 60° at its centre. What is the radius of the circle? [Use $\pi = \frac{22}{7}$]

(a) 42π cm (b) 21π cm
(c) 42 cm (d) 21 cm

37. In the given figure, a chord AB of the circle with centre O and radius 10 cm, that subtends a right angle at the centre of the circle. What is the area of the minor segment $AQBP$. What is the area of major

segment $ALBQA$? (Use $\pi = 3.14$)

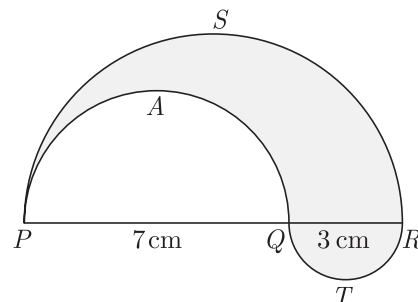


- (a) 285.5 cm^2 (b) 168.5 cm^2
(c) 210.5 cm^2 (d) 192.5 cm^2

38. The zeroes of the polynomial $p(x) = 4x^2 - 12x + 9$ will be

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

39. In the fig., PSR , RTQ and PAQ are three semi-circles of diameters 10 cm, 3 cm and 7 cm region respectively. What is the perimeter of shaded region? Use $\pi = \frac{22}{7}$.



- (a) 62.1 cm^2 (b) 92.1 cm^2
(c) 31.4 cm^2 (d) 12.4 cm^2

40. The length of the sides of a triangle are $2x + \frac{y}{2}$, $\frac{5x}{3} + y + \frac{1}{2}$ and $\frac{2}{3}x + 2y + \frac{5}{2}$. If the triangle is equilateral, its perimeter is

- (a) 14.5 m (b) 29 m
(c) 19.5 m (d) 39 m

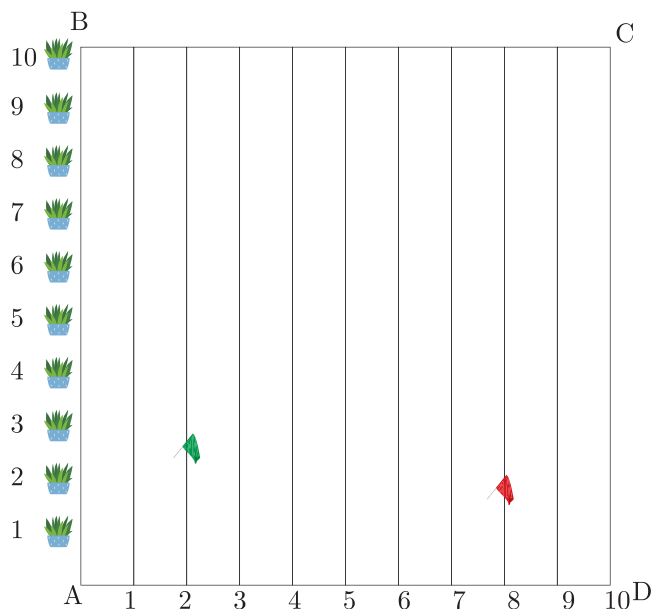
SECTION C

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)

To conduct sports day activities, in a rectangular shaped school ground $ABCD$, lines have been drawn with chalk powder at a distance of 1 m each. 100 flower pots have been placed at a distance of 1 m from each other along AB , as shown in figure. Nishtha runs $\frac{1}{4}$ th the distance AB on the 2nd line and posts a green flag. Suman runs $\frac{1}{5}$ th the distance AB on the 8th line and posts a red flag.



41. What is the position of green flag ?

- (a) (2, 25) (b) (25, 4)
(c) (25, 2) (d) (4, 25)

42. What is the position of red flag ?

- (a) (20, 4) (b) (8, 20)
(c) (20, 8) (d) (4, 20)

43. What is the distance between both the flags?

- (a) $\sqrt{51}$ (b) $3\sqrt{3}$
(c) $\sqrt{61}$ (d) $2\sqrt{3}$

44. What is the distance of red flag from point A ?

- (a) $4\sqrt{29}$ (b) $2\sqrt{29}$
(c) $8\sqrt{15}$ (d) $16\sqrt{3}$

45. If Rakhi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?

- (a) (20, 4) (b) (22.5, 5)
(c) (4, 20) (d) (5, 22.5)

Case Based Questions: (46-50)

An barrels manufacturer can produce up to 300 barrels per day. The profit made from the sale of these barrels can be modelled by the function $P(x) = -10x^2 + 3500x - 66000$ where $P(x)$ is the profit in rupees and x is the number of barrels made and sold.



Based on this model answer the following questions:

46. When no barrels are produce what is a profit loss?
(a) ₹ 22000 (b) ₹ 66000
(c) ₹ 11000 (d) ₹ 33000
47. What is the break even point ? (Zero profit point is called break even)
(a) 10 barrels (b) 30 barrels
(c) 20 barrels (d) 100 barrels
48. What is the profit/loss if 175 barrels are produced
(a) Profit 266200 (b) Loss 266200
(c) Profit 240250 (d) Loss 240250
49. What is the profit/loss if 400 barrels are produced
(a) Profit ₹ 466200 (b) Loss ₹ 266000
(c) Profit ₹ 342000 (d) Loss ₹ 342000
50. What is the maximum profit which can manufacturer earn?
(a) ₹ 240250 (b) ₹ 480500
(c) ₹ 680250 (d) ₹ 240250

SAMPLE PAPER - 14 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(b)	Ch-1	7
2	(b)	Ch-3	29
3	(d)	Ch-4	S-123
4	(d)	Ch-4	41
5	(c)	Ch-8	8
6	(c)	Ch-4	29
7	(d)	Ch-6	1
8	(c)	Ch-1	9
9	(b)	Ch-3	31
10	(a)	Ch-5	21
11	(d)	Ch-2	S-6
12	(c)	Ch-1	15
13	(a)	Ch-6	31
14	(c)	Ch-6	100
15	(b)	Ch-7	8
16	(b)	Ch-4	23
17	(d)	Ch-4	S-138
18	(a)	Ch-6	93
19	(b)	Ch-3	S-1
20	(d)	Ch-8	S-4
21	(b)	Ch-1	36
22	(a)	Ch-5	45
23	(c)	Ch-6	61
24	(a)	Ch-3	82
25	(a)	Ch-2	35

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(a)	Ch-8	163
27	(a)	Ch-8	122
28	(d)	Ch-6	129
29	(d)	Ch-5	S-5
30	(b)	Ch-4	142
31	(a)	Ch-5	S-29
32	(a)	Ch-6	81
33	(b)	Ch-1	60
34	(d)	Ch-4	D-58
35	(a)	Ch-5	D-84
36	(d)	Ch-7	S-4
37	(a)	Ch-7	S-14
38	(a)	Ch-2	32
39	(c)	Ch-7	S-24
40	(c)	Ch-3	98
41	(a)	Ch-5	126
42	(b)	Ch-5	127
43	(c)	Ch-5	128
44	(a)	Ch-5	129
45	(d)	Ch-5	130
46	(b)	Ch-2	89
47	(c)	Ch-2	90
48	(d)	Ch-2	91
49	(b)	Ch-2	92
50	(a)	Ch-2	93

* S- = Self Test Question, * D- = Direction Based Question