

Sample/Pre-Board Paper 32
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.

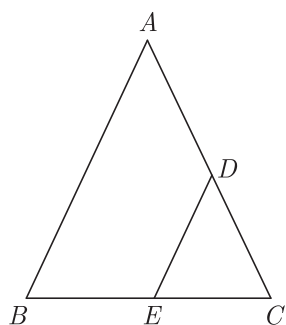
1. The decimal representation of $\frac{11}{2^3 \times 5}$ will
 - (a) terminate after 1 decimal place
 - (b) terminate after 2 decimal place
 - (c) terminate after 3 decimal places
 - (d) not terminate
2. If α and β are the zeroes of a polynomial $x^2 - 4\sqrt{3}x + 3$, then the value of $\alpha + \beta - \alpha\beta$ will be
 - (a) $\sqrt{3}(2 - \sqrt{3})$
 - (b) $\sqrt{3}(2 + \sqrt{3})$
 - (c) $\sqrt{3}(4 + \sqrt{3})$
 - (d) $\sqrt{3}(4 - \sqrt{3})$
3. Two poles of height 6 m and 11 m stand vertically upright on a plane ground. If the distance between their foot is 12 m, then distance between their tops is
 - (a) 12 m
 - (b) 14 m
 - (c) 13 m
 - (d) 11 m
4. Sides of two similar triangles are in the ratio 4 : 9. Areas of these triangles are in the ratio.
 - (a) 2 : 3
 - (b) 4 : 9
 - (c) 81 : 16
 - (d) 16 : 81
5. Which of the following cannot be the probability of an event?
 - (a) $\frac{1}{3}$
 - (b) 0.1
 - (c) 3%
 - (d) $\frac{17}{16}$
6. If $\Delta ABC \sim \Delta PQR$, $\frac{AB}{PQ} = \frac{1}{3}$, then $\frac{\text{ar } \Delta ABC}{\text{ar } \Delta PQR}$ will be
 - (a) $\frac{1}{3}$
 - (b) $\frac{1}{9}$
 - (c) $\frac{8}{9}$
 - (d) $\frac{5}{9}$
7. If $\cos A = \frac{4}{5}$, then the value of $\tan A$ is
 - (a) $\frac{3}{5}$
 - (b) $\frac{3}{4}$
 - (c) $\frac{4}{3}$
 - (d) $\frac{5}{3}$
8. The rational number of the form $\frac{p}{q}$, $q \neq 0$, p and q are positive integers, which represents $0.1\overline{34}$ i.e., (0.1343434) is
 - (a) $\frac{134}{999}$
 - (b) $\frac{134}{990}$
 - (c) $\frac{133}{999}$
 - (d) $\frac{133}{990}$
9. The 2 digit number which becomes $\frac{5}{6}$ th of itself when its digits are reversed. The difference in the digits of the number being 1, then the two digits number is
 - (a) 45
 - (b) 54
 - (c) 36
 - (d) None of these
10. The distance between the points $(a \cos \theta + b \sin \theta, 0)$, and $(0, a \sin \theta - b \cos \theta)$ is
 - (a) $a^2 + b^2$
 - (b) $a^2 - b^2$
 - (c) $\sqrt{a^2 + b^2}$
 - (d) $\sqrt{a^2 - b^2}$
11. The sum of exponents of prime factors in the prime-factorisation of 1764 is
 - (a) 3
 - (b) 4
 - (c) 5
 - (d) 6
12. If two positive integers p and q are written as $p = a^2 b^3$ and $q = a^3 b$, where a and b are prime numbers than $\text{LCM}(p, q) \times \text{HCF}(q, p) = ?$
 - (a) pq
 - (b) $p^2 q$
 - (c) qp^2
 - (d) $q^2 p^2$

13. If $x\sin^3\theta + y\cos^3\theta = \sin\theta\cos\theta$ and $x\sin\theta = y\cos\theta$, then $x^2 + y^2$ is equal to
- (a) 0 (b) $1/2$
(c) 1 (d) $3/2$

14. $\sin^2 60^\circ - 2\tan 45^\circ - \cos^2 30^\circ = ?$
- (a) 2 (b) -2
(c) 1 (d) -1

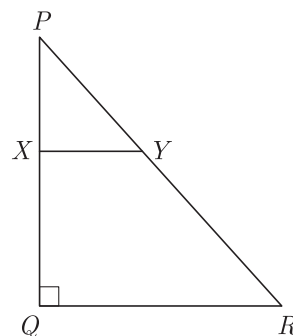
15. If diameter of a wheel is 1.26 m, what the distance covered in 500 revolutions?
- (a) 1.38 km (b) 4.64 km
(c) 2.46 km (d) 1.98 km

16. In the figure of $\triangle ABC$, the points D and E are on the sides CA, CB respectively such that $DE \parallel AB$, $AD = 2x, DC = x + 3, BE = 2x - 1$ and $CE = x$. Then, value of x will be



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

17. In the given figure, PQR is a triangle right angled at Q and $XY \parallel QR$. If $PQ = 6$ cm, $PY = 4$ cm and $PX : XQ = 1 : 2$. The length of PR will be



- (a) 12 cm (b) $2\sqrt{3}$ cm
(c) $6\sqrt{3}$ cm (d) 18 cm

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

- (a) 1 (b) $2\sec^2\theta$
(c) $2\sin^2\theta$ (d) $2\cos^2\theta$

19. For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines ?

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

20. The probability of getting a number greater than 3 in throwing a die 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. Taniya have 54 football cards, 72 volleyball cards, and 63 basketball cards and she want to put them in a binder. Each page of the binder should have cards from a single sport, and there should be the same number of cards on each page.



What is the greatest number of cards, Taniya can put on a page?

- (a) 9 (b) 12
(c) 15 (d) 18

22. If the centre of a circle is $(3, 5)$ and end points of a diameter are $(4, 7)$ and $(2, y)$, then the value of y is
- (a) 3 (b) -3
(c) 7 (d) 4

23. If θ be an acute angle and $5\operatorname{cosec}\theta = 7$, then value of $\sin\theta + \cos^2\theta - 1$ will be

- (a) $\frac{10}{49}$ (b) $\frac{39}{49}$
(c) $\frac{10}{47}$ (d) $\frac{37}{47}$

24. If $ad \neq bc$, then what do you say about the solution of the pair of linear equations $ax + by = p$ and $cx + dy = q$?

- (a) no solution (b) unique solution
(c) infinitely solution (d) can't say anything

25. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is

- (a) 10 (b) -10
(c) -7 (d) -2

26. Two dice are thrown together. The probability that sum of the two numbers will be a multiple of 4, is:

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$
(c) $\frac{1}{8}$ (d) $\frac{1}{4}$

27. A card drawn at random from a well shuffled deck of 52 playing cards. What is the probability of getting a black king?

- (a) $\frac{1}{13}$ (b) $\frac{1}{26}$
(c) $\frac{3}{26}$ (d) $\frac{1}{52}$

28. $(\cot \theta - \operatorname{cosec} \theta)^2 = ?$

- (a) $\frac{1 - \cos \theta}{1 + \cos \theta}$ (b) $\frac{1 + \cos \theta}{1 - \cos \theta}$
(c) $\frac{\cos \theta + 1}{\cos \theta - 1}$ (d) $\frac{\cos \theta - 1}{\cos \theta + 1}$

29. The distance between the points $A(0, 6)$ and $B(0, -2)$ is

- (a) 6 (b) 8
(c) 4 (d) 2

30. In ΔABC , $DE \parallel BC$. If $AD = x + 2$, $DB = 3x + 16$, $AE = x$ and $EC = 3x + 5$, then x is equal to

- (a) 2 (b) 3
(c) 4 (d) 5

31. Which of the following the point on the x-axis which is equidistant from the points $(2, -5)$ and $(-2, 9)$?

- (a) $(-7, 0)$ (b) $(7, 0)$
(c) $(0, 7)$ (d) $(-7, 0)$

32. $\frac{\sin \theta}{\cot \theta + \operatorname{cosec} \theta} = ?$

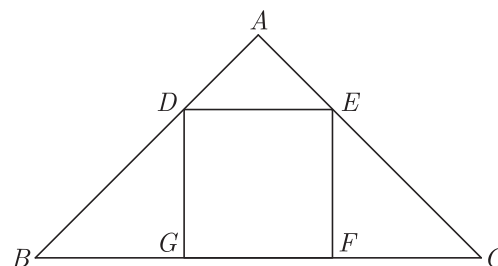
- (a) $1 - \cos \theta$ (b) $1 + \cos \theta$
(c) $1 + \sin \theta$ (d) $1 - \sin \theta$

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. 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) $\frac{1}{4} BG \times FC$

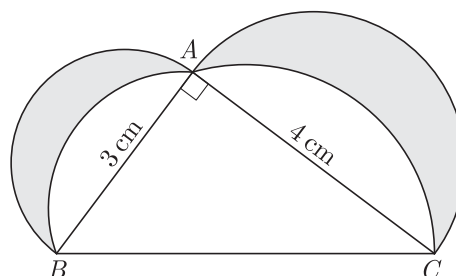
35. The co-ordinate of the point dividing the line segment joining the points $A(1, 3)$ and $B(4, 6)$ in the ratio $2 : 1$ is

- (a) $(5, 3)$ (b) $(3, 5)$
(c) $(4, 6)$ (d) $(6, 4)$

36. A wire when bent in the form of an equilateral triangle encloses an area of $121\sqrt{3}$ cm². If the wire is bent in the form of a circle, what is the area enclosed by the circle? Use $\pi = \frac{22}{7}$.

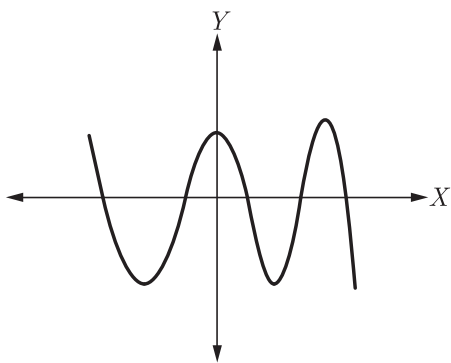
- (a) 246.5 cm² (b) 620.5 cm²
(c) 921.5 cm² (d) 346.5 cm²

37. In the given figure, ΔABC is a right angled triangle in which $\angle A = 90^\circ$. Semicircles are drawn on AB, AC and BC as diameters. What is the area of the shaded region?



- (a) 12 cm² (b) 6 cm²
(c) 18 cm² (d) 9 cm²

38. 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

39. The long and short hands of a clock are 6 cm and 4 cm long respectively. What is the sum of distances travelled by their tips in 24 hours. (Use $\pi = 3.14$)
(a) 810 cm (b) 955 cm
(c) 620 cm (d) 710 cm
40. For what value of k , the system of equations $kx + 3y = 1$, $12x + ky = 2$ has no solution.
(a) $k = -6$ (b) $k \neq -6$
(c) $k = 4$ (d) $k = -4$

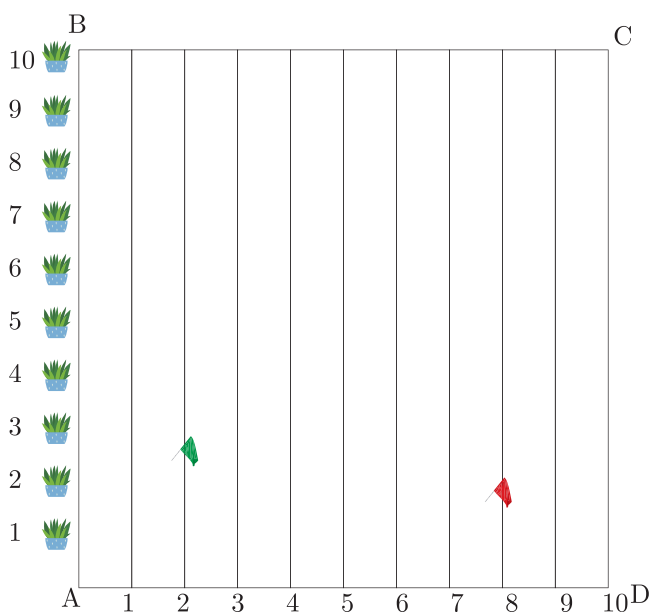
SECTION C

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)

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 - 27 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(c)	Ch-1	4
2	(d)	Ch-2	S-7
3	(c)	Ch-4	5
4	(c)	Ch-4	15
5	(d)	Ch-8	4
6	(b)	Ch-4	28
7	(b)	Ch-6	4
8	(d)	Ch-1	18
9	(b)	Ch-3	4
10	(c)	Ch-5	4
11	(d)	Ch-1	33
12	(a)	Ch-1	S-20
13	(c)	Ch-6	18
14	(b)	Ch-6	33
15	(d)	Ch-7	35
16	(c)	Ch-4	38
17	(a)	Ch-4	D-48
18	(b)	Ch-6	50
19	(c)	Ch-3	15
20	(d)	Ch-8	16
21	(a)	Ch-1	D-48
22	(a)	Ch-5	14
23	(a)	Ch-6	63
24	(b)	Ch-3	27
25	(b)	Ch-2	4

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(d)	Ch-8	26
27	(b)	Ch-8	36
28	(a)	Ch-6	77
29	(b)	Ch-5	25
30	(a)	Ch-4	60
31	(a)	Ch-5	49
32	(a)	Ch-6	93
33	(b)	Ch-1	60
34	(b)	Ch-4	71
35	(b)	Ch-5	38
36	(d)	Ch-7	68
37	(b)	Ch-7	89
38	(d)	Ch-2	27
39	(b)	Ch-7	99
40	(a)	Ch-3	37
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