Sample/Pre-Board Paper 18

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

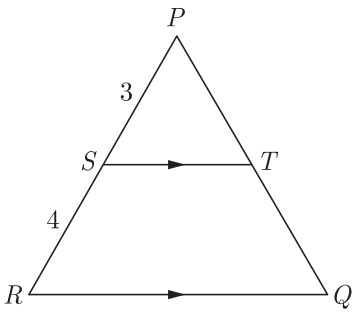
(c) three decimal places (d) four decimal places

2. 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) $k=4$

3. In the given figure, $ST||RQ, PS=3$ 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. A ladder 25 m long just reaches the top of a building 24 m high from the ground. What is the distance of the foot of ladder from the base of the building?

(a) 9 m (b) 10.5 m

(c) 14 m (d) 7 m

5. If the probability of an event is p, then the probability of its complementary event will be

(a) $p-1$ (b) p

(c) $1-p$ (d) $1-\frac{1}{p}$

6. ΔABC is isosceles with $AC=BC$. If $AB^2=2AC^2$, then the measure of $\angle C$ will be

(a) 30° (b) 60°

(c) 45° (d) 90°

7. 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

8. 225 can be expressed as

(a) 5×3^2 (b) $5^2\times 3$

(c) $5^2\times 3^2$ (d) $5^3\times 3$

9. 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

10. C is the mid-point of PQ, if P is $(4,x)$, C is $(y,-1)$ and Q is $(-2,4)$, then x and y respectively are

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

(c) 6 and -1 (d) 6 and -2

11. Select the quadratic polynomial $p(x)$ with 3 and $-\frac{2}{5}$ as sum and product of its zeroes, respectively.

(a) $x^2-3x-\frac{2}{5}$ (b) x^2-3x-2

(c) $5x^2-15x-2$ (d) $15x^2-5x+\frac{2}{5}$

12. If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, where x, y are prime numbers, then HCF (a, b) is

(a) xy (b) xy^2

(c) x^3y^3 (d) x^2y^2

13. The value of $(1+\tan^2\theta)(1-\sin\theta)(1+\sin\theta) =$ ..... .

(a) 0 (b) 1

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

14. $\sin^2 30^\circ \cos^2 45^\circ + 4\tan^2 30^\circ + \frac{1}{2}\sin 90^\circ - 2\cos^2 90^\circ + \frac{1}{24} = ?$

(a) 0 (b) 1

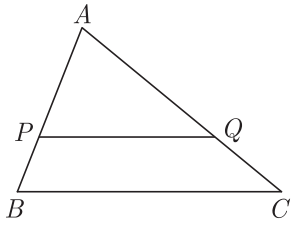
(c) 2 (d) 3

15. The sum of the areas of two circle, which touch each other externally, is $153\,\pi$. If the sum of their radii is 15, then the ratio of the larger to the smaller radius is

(a) 4:1 (b) 2:1

(c) 3:1 (d) None of these

16. 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) $(\sqrt{2}-1):1$

17. The perpendicular AD on the base BC of a ΔABC intersects BC at D so that $DB = 3CD$. The term AB^2 is equal to

(a) $2AC^2 + BC^2$ (b) $AC^2 + 2BC^2$

(c) $\frac{1}{2}AC^2 + 2BC^2$ (d) $AC^2 + \frac{1}{2}BC^2$

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

(a) $1 + \sec\theta + \cot\theta$ (b) $1 + \tan\theta + \cot\theta$

(c) $1 + \tan\theta + \sec\theta$ (d) $1 + \sec\theta + \operatorname{cosec}\theta$

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 intersecting lines.

(a) $3x - 5y = 10$ (b) $6x + 8y = 18$

(c) $8x + 12y = 18$ (d) above all

20. If $P(E) = 0.20$, then what is the probability of not E?

(a) 0.85 (b) 0.25

(c) 0.10 (d) 0.80

SECTION B

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

21. The HCF and LCM of 378, 180 and 420 of will be

(a) 6 and 3980 (b) 12 and 3780

(c) 6 and 3780 (d) 12 and 3980

22. What is the ratio in which the point $P\left(\frac{3}{4}, \frac{5}{12}\right)$ divides the line segment joining the point $A\ \left(\frac{1}{2}, \frac{3}{2}\right)$ and $(2, -5)$.

(a) 4 : 7 (b) 3 : 7

(c) 1 : 5 (d) 2 : 5

23. If $\sin\phi = \dfrac{1}{2}$, then $3\cos\phi - 4\cos^3\phi = ?$

(a) 0 (b) –1

(c) 1 (d) –2

24. Solve the following pair of equations :
$2(3x - y) = 5xy, 2(x + 3y) = 5xy$.
What is the value of x ?

(a) 1 (b) 2

(c) 3 (d) 4

25. If p and q are the zeroes of polynomial $f(x) = 2x^2 - 7x + 3$, the value of $p^2 + q^2$ will be

(a) $\frac{39}{5}$ (b) $\frac{5}{39}$

(c) $\frac{37}{4}$ (d) $\frac{4}{37}$

26. Two different dice are thrown together. What is the probability that the numbers obtained have even sum?

(a) 0.50 (b) 0.3

(c) 0.8 (d) 0

27. Three unbiased coins are tossed together. What is the probability of getting almost two heads?

(a) $\frac{5}{8}$ (b) $\frac{3}{8}$

(c) $\frac{7}{8}$ (d) $\frac{1}{4}$

28. If $\frac{\sin\phi}{1+\cos\phi}+\frac{1+\cos\phi}{\sin\phi}=4$ then ϕ is equal to

(a) 9^o (b) 90^o

(c) 45^o (d) 30^o

29. The ordinate of a point A on y-axis is 5 and B has co-ordinates $(-3,1)$. The length of AB will be

(a) 4 (b) 5

(c) 6 (d) 7

30. In an equilateral triangle ABC, D is a point on the side BC such the $BD=\frac{1}{3}BC$. The term AD^2 is equal to

(a) $\frac{9}{7}AB^2$ (b) $\frac{7}{9}AB^2$

(c) $\frac{4}{5}AB^2$ (d) $\frac{5}{4}AB^2$

31. If the point $C(-1,2)$ divides internally the line segment joining the points $A(2,5)$ and $B(x,y)$ in the ratio 3:4, the value of x^2+y^2 will be

(a) 25 (b) 29

(c) 27 (d) 28

32. $\frac{\cos^3\theta+\sin^3\theta}{\cos\theta+\sin\theta}+\frac{\cos^3\theta-\sin^3\theta}{\cos\theta-\sin\theta}=?$

(a) 1 (b) 2

(c) 3 (d) 4

33. At a train station, the blue line has a train leaving every 15 minutes, the green line has a train leaving every 24 minutes, and the red line every 10 minutes. If the first train on each line leaves at the same time, how often will there be trains on all three lines departing the train station at the same time?

(a) 60 minute (b) 90 minute

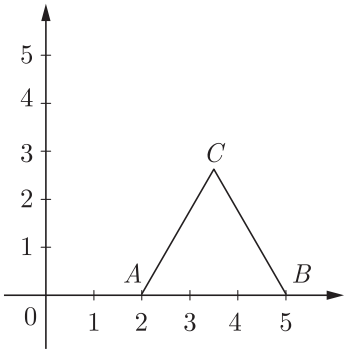
(c) 120 minute (d) 150 minute

34. The length of QR will be

(a) 16 cm (b) $2\sqrt{3}$ cm

(c) $6\sqrt{3}$ cm (d) 18 cm

35. In the given figure ΔABC is an equilateral triangle of side 3 units. The co-ordinates of the point C will be



(a) $\left(\frac{7}{2},\frac{3}{2}\sqrt{3}\right)$ (b) $\left(\frac{5}{2},\frac{3}{2}\sqrt{3}\right)$

(c) $\left(\frac{5}{2},\frac{1}{2}\sqrt{3}\right)$ (d) $\left(\frac{7}{2},\frac{1}{2}\sqrt{3}\right)$

36. The perimeter of a sector of a circle with radius 6.5 cm is 31 cm, what is the area of the sector?

(a) 31 cm^2 (b) 117π cm^2

(c) 58.5 cm^2 (d) 117 cm^2

37. Sides of a right triangular field are 25 m, 24 m and 7 m. At the three corners of the field, a cow, a buffalo and a horse are tied separately with ropes of 3.5 m each to graze in the field. What is the area of the field that cannot be grazed by these animals?

(a) 138 m^2 (b) 129.5 m^2

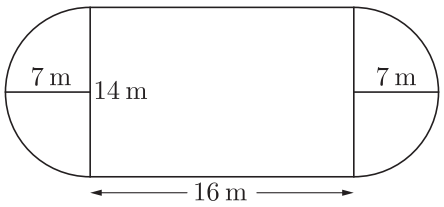
(c) 64.75 m^2 (d) 196 m^2

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

(a) -7 (b) 1

(c) -1 (d) -6

39. What is the area of the adjoining diagram?



(a) 214 m^2 (b) 126 m^2

(c) 378 m^2 (d) 412 m^2

40. When 6 boys were admitted and 6 girls left, the percentage of boys increased from 60% to 75%. What is the original no. of boys and girls in the class ?

(a) 24 and 16 (b) 16 and 24

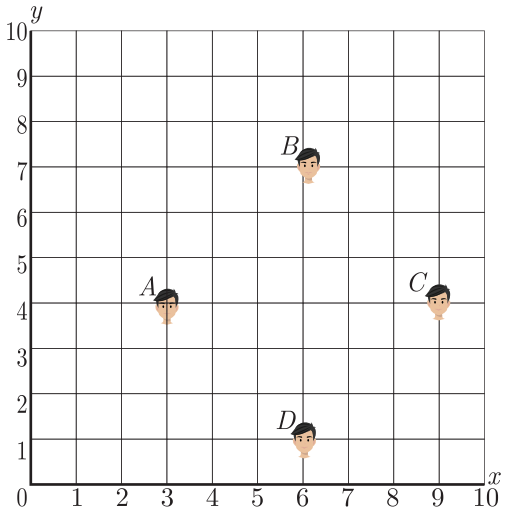
(c) 12 and 16 (d) 16 and 12

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) $2\sqrt{3}$

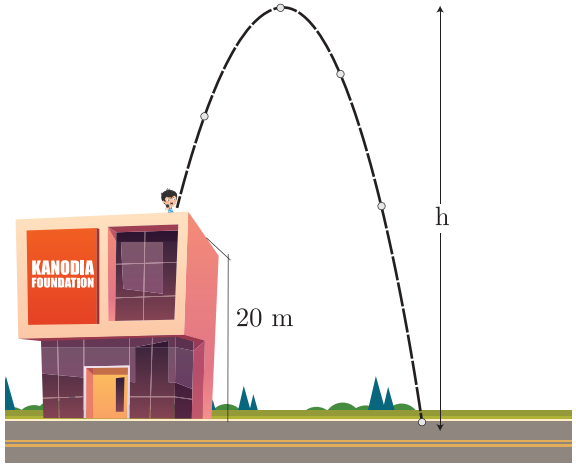
45. Distance of point $P(3, 4)$ from x-axis is

(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 $h = -4t^2 + 16t + 20$.



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 - 13 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(d)	Ch-1	10
2	(a)	Ch-3	36
3	(d)	Ch-4	S-122
4	(d)	Ch-4	S-125
5	(c)	Ch-8	6
6	(d)	Ch-4	30
7	(a)	Ch-6	3
8	(c)	Ch-1	8
9	(a)	Ch-3	26
10	(a)	Ch-5	20
11	(a)	Ch-2	S-4
12	(b)	Ch-1	14
13	(b)	Ch-6	29
14	(c)	Ch-6	99
15	(a)	Ch-7	7
16	(c)	Ch-4	11
17	(d)	Ch-4	S-149
18	(b)	Ch-6	104
19	(a)	Ch-3	34
20	(d)	Ch-8	S-3
21	(c)	Ch-1	35
22	(c)	Ch-5	44
23	(a)	Ch-6	54
24	(b)	Ch-3	D-83
25	(c)	Ch-2	38

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(a)	Ch-8	164
27	(c)	Ch-8	124
28	(d)	Ch-6	124
29	(b)	Ch-5	S-4
30	(b)	Ch-4	S-141
31	(b)	Ch-5	S-26
32	(b)	Ch-6	85
33	(c)	Ch-1	59
34	(c)	Ch-4	D-49
35	(a)	Ch-5	81
36	(c)	Ch-7	S-3
37	(c)	Ch-7	S-13
38	(a)	Ch-2	34
39	(c)	Ch-7	S-23
40	(a)	Ch-3	99
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, * D- = Direction Based Question**