Sample/Pre-Board Paper 25

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 $\dfrac{11}{2^3 \times 5}$ will

(a) terminate after 1 decimal place

(b) terminate after 2 decimal place

(c) terminate after 3 decimal places

(d) not terminate

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

(a) $\dfrac{1}{2}$ (b) $-\dfrac{1}{2}$

(c) 2 (d) -2

3. Let $\Delta ABC \sim \Delta DEF$. if $\text{ar}(\Delta ABC) = 100 \text{ cm}^2$, $\text{ar}(DEF) = 196 \text{ cm}^2$, and $DE = 7$, then what is the length of side AB?

(a) 2 cm (b) 5 cm

(c) 7 cm (d) 4 cm

4. In ΔABC, $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm, then $\angle B = $ ....

(a) $30°$

(b) $60°$

(c) $45°$

(d) $90°$

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

(a) $\dfrac{1}{13}$

(b) $\dfrac{1}{26}$

(c) $\dfrac{3}{26}$

(d) $\dfrac{1}{52}$

6. In the given figure, $\Delta ABC \sim \Delta PQR$. The value of $y + z$ will be


(a) $2\sqrt{2} + 3$ (b) $3\sqrt{3} + 4$

(c) $3\sqrt{2} + 1$ (d) $2\sqrt{3} + 2$

7. If $\cot\theta = \dfrac{12}{5}$, then the value of $\sin\theta$ is ....

(a) $\dfrac{5}{13}$ (b) $\dfrac{8}{12}$

(c) $\dfrac{12}{5}$ (d) $\dfrac{13}{5}$

8. Which of the following is the HCF of the smallest composite number and the smallest prime number?

(a) 2 (b) 4

(c) 6 (d) 8

9. The pair of linear equations $2kx + 5y = 7$, $6x - 5y = 11$ has a unique solution, if

(a) $k \neq -3$ (b) $k \neq \dfrac{2}{3}$

(c) $k \neq 5$ (d) $k \neq \dfrac{2}{9}$

10. 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)

11. If one zero of the polynomial $(3x^2 + 8x + k)$ is the reciprocal of the other, then value of k is

(a) 3

(b) -3

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

(d) $-\frac{1}{3}$

12. The decimal representation of $\dfrac{21}{16 \times 15}$ will

(a) terminate after 2 decimal place

(b) terminate after 3 decimal place

(c) terminate after 4 decimal places

(d) terminate after 5 decimal places

13. If $b\cos\theta = a$, then $\operatorname{cosec}\theta + \cot\theta = ?$

(a) $\sqrt{\dfrac{b-a}{2ab}}$

(b) $\sqrt{\dfrac{b+a}{b-a}}$

(c) $\sqrt{\dfrac{a-b}{2ab}}$

(d) $\sqrt{\dfrac{b-a}{b+a}}$

14. What happens to value of $\cos\theta$ when θ increases from 0° to 90°.

(a) $\cos\theta$ decreases from 1 to 0.

(b) $\cos\theta$ increases from 0 to 1.

(c) $\cos\theta$ increases from $\frac{1}{2}$ to 1

(d) $\cos\theta$ decreases from 1 to $\frac{1}{2}$

15. The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii $24\,\text{cm}$ and $7\,\text{cm}$ is

(a) $31\,\text{cm}$

(b) $25\,\text{cm}$

(c) $62\,\text{cm}$

(d) $50\,\text{cm}$

16. From an airport, two aeroplanes start at the same time. If speed of first aeroplane due North is 500 km/h and that of other due East is 650 km/h then the approximate distance between the two aeroplanes after 2 hours will be

(a) 1890 km

(b) 1120 km

(c) 1640 km

(d) 2240 km

17. In Figure $\angle D = \angle E$ and $\dfrac{AD}{DB} = \dfrac{AE}{EC}$, then ΔBAC is

(a) isosceles triangle

(b) scalene triangle

(c) equilateral triangle

(d) right angle triangle
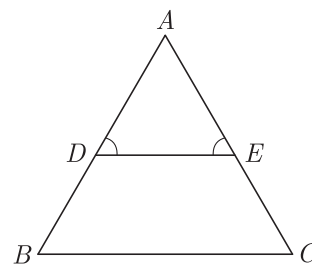
18. If $\sqrt{3}\sin\theta - \cos\theta = 0$ and $0^\circ < \theta < 90^\circ$, the value of θ. will be

(a) 30°

(b) 45°

(c) 60°

(d) 90°

19. In the figure given below, $ABCD$ is a rectangle. The values of x and y will be
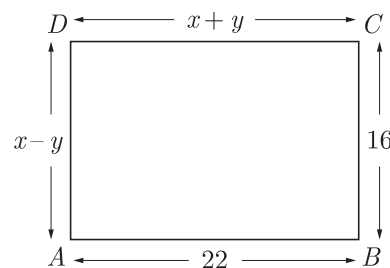
(a) 3 and 19

(b) 19 and 3

(c) 4 and 18

(d) 18 and 4

20. What is the probability of getting a sum of 9, when two dice are thrown simultaneously?

(a) $\frac{1}{9}$

(b) $\frac{7}{9}$

(c) $\frac{5}{9}$

(d) $\frac{2}{9}$

SECTION B

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

21. Lina is preparing dinner plates. She has 12 pieces of chicken and 16 rolls. If she wants to make all the plates identical without any food left over, what is the

greatest number of plates Lina can prepare ?

(a) 1 plate   (b) 2 plate

(c) 3 plate   (d) 4 plate

22. What are the co-ordinates of the points of trisection of the line segment joining the points $A(1, -2)$ and $B(-3, 4)$?

(a) $\left(2, \frac{-5}{2}\right)$ (b) $\left(\frac{-5}{2}, 2\right)$

(c) $\left(2, \frac{5}{2}\right)$ (d) $\left(\frac{5}{2}, 2\right)$

23. If $\sin\theta = \dfrac{c}{\sqrt{c^2 + d^2}}$ and $d > 0$, then $\cos\theta$ is equal to

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

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

24. A train covered a certain distance at a uniform speed. If the train would have been 10 km/hr scheduled time. And, if the train were slower by 10 km/hr, it would have taken 3 hr more than the scheduled time.
What is the actual speed of train?

(a) 50 kmph   (b) 60 kmph

(c) 40 kmph   (d) 30 kmph

25. If the square of difference of the zeroes of the quadratic polynomial $x^2 + px + 45$ is equal to 144, then the value of p is

(a) ± 9 (b) ± 12

(c) ± 15 (d) ± 18

26. From all the two digit numbers a number is chosen at random. What is the probability that the chosen number is a multiple of 7?

(a) $\frac{7}{10}$ (b) $\frac{13}{90}$

(c) $\frac{5}{10}$ (d) $\frac{17}{90}$

27. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of red ball, How many balls are in the bag?

(a) 12   (b) 10

(c) 8   (d) 4

28. $\dfrac{5\cos^2 60^\circ + 4\cos^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 60^\circ} = ?$

(a) $\frac{41}{49}$ (b) $\frac{13}{2}$

(c) $\frac{15}{2}$ (d) $\frac{15}{6}$

29. The point $(-3, k)$ divides the line segment joining the points $(-5, -4)$ and $(-2, 3)$. The alue of k will be

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

(c) $\frac{1}{3}$ (d) $\frac{1}{2}$

30. Two right triangles ABC and DBC are drawn on the same hypotenuse BC and on the same side of BC. If AC and BD intersect at P, then $AP \times PC$ is equal to

(a) $3BP \times DP$ (b) $2BP \times DP$

(c) $BP \times DP$ (d) $\frac{1}{2}BP \times DP$

31. What is the value of a so that $(3, a)$ lies on the line represented by $2x - 3y - 5 = 0$?

(a) $\frac{5}{2}$ (b) $\frac{1}{3}$

(c) $\frac{3}{2}$ (d) $\frac{1}{3}$

32. If $\cos\theta + \sin\theta = p$ and $\sec\theta + \operatorname{cosec}\theta = q$, then $q(p^2 - 1) = ?$

(a) $2p$ (b) p

(c) $4p$ (d) $3p$

33. What are the HCF and LCM of 16 and 36?

(a) 4 and 9   (b) 9 and 4

(c) 4 and 144   (d) 144 and 4

34. Aakesh wanted to determine the height of a tree on the corner of his block. He knew that a certain fence by the tree was 4 feet tall. At 3 PM, he measured the shadow of the fence to be 2.5 feet tall. Then he measured the tree's shadow to be 11.3 feet. What is the height of the tree?


(a) 12 feet   (b) 11 feet

(c) 18 feet   (d) 30 feet

35. The line segment joining the points $A(3, 2)$ and $B(5, 1)$ is divided at the point P in the ratio $1:2$ and P lies on the line $3x - 18y + k = 0$. The value of k will be

(a) 21   (b) 20

(c) 19   (d) 22

36. Three horses are tied each with 7 m long rope at three corners of a triangular field having sides 20 m, 34 m and 42 m. What is the area of the plot which can be grazed by the horses?

(a) 77 m²
(b) 154 m²
(c) 88 m²
(d) 176 m²

37. If the radius of the circle is 6 cm and the length of an arc 12 cm. What is the area of the sector?
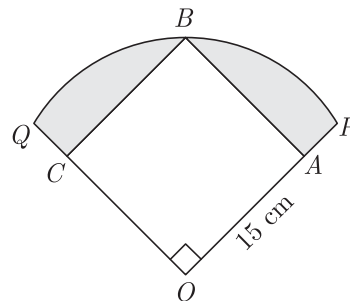
(a) 36 cm²
(b) 18 cm²
(c) 72 cm²
(d) 108 cm²

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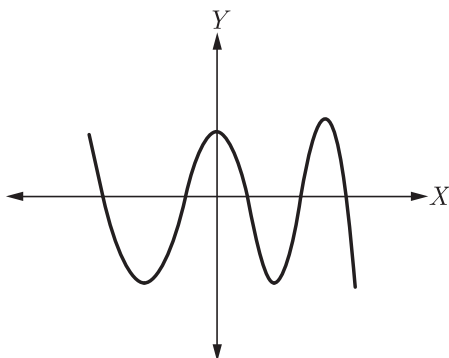
The number of zeroes of $p(x)$ is ....

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

39. In given figure, a square $OABC$ is inscribed in a quadrant $OPBQ$. If $OA = 15$ cm, what is the area of the shaded region? (Use $\pi = 3.14$).

(a) 226.5 cm²
(b) 128.25 cm²
(c) 198.5 cm²
(d) 250.5 cm²

40. One says, "Give me a hundred, friend! I shall then become twice as rich as you." The other replies, "If you give me ten, I shall be six times as rich as you." What is the amount of their (respective) capital ?

(a) Rs 80 and Rs 190
(b) Rs 20 and Rs 160
(c) Rs 40 and Rs 170
(d) Rs 100 and Rs 200

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.
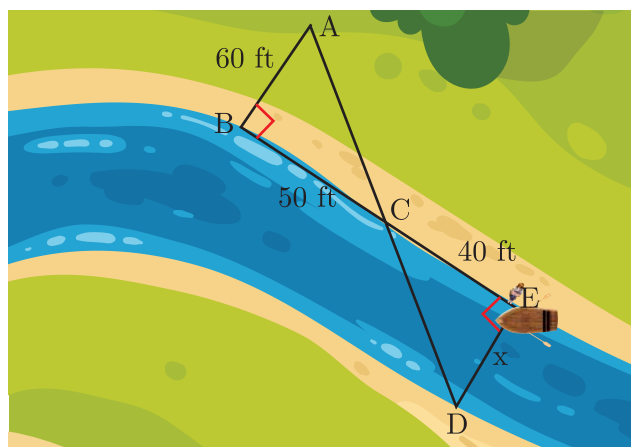
41. Which similarity criterion is used in solving the above problem ?

(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: (46-50)

Amar, Akbar and Anthony are playing a game. Amar climbs 5 stairs and gets down 2 stairs in one turn. Akbar goes up by 7 stairs and comes down by 2 stairs every time. Anthony goes 10 stairs up and 3 stairs down each time.

Doing this they have to reach to the nearest point of 100th stairs and they will stop once they find it impossible to go forward. They can not cross 100th stair in anyway.

46. Who reaches the nearest point?

(a) Amar

(b) Akbar

(c) Anthony

(d) All together reach to the nearest point.

47. How many times can they meet in between on same stair ?

(a) 3

(b) 4

(c) 5

(d) No, they cannot meet in between on same stair.

48. Who takes least number of steps to reach near hundred?

(a) Amar

(b) Akbar

(c) Anthony

(d) All of them take equal number of steps.

49. What is the first stair where any two out of three will meet together?

(a) Amar and Akbar will meet for the first time on 15th stair.

(b) Akbar and Anthony will meet for the first time on 35th stair.

(c) Amar and Anthony will meet for the first time on 21th stair.

(d) Amar and Akbar will meet for the first time on 21th stair.

50. What is the second stair where any two out of three will meet together?

(a) Amar and Akbar will meet on 21th stair.

(b) Akbar and Anthony will meet on 35th stair.

(c) Amar and Anthony will meet on 21th stair.

(d) Amar and Anthony will meet on 35th stair.

SAMPLE PAPER - 20 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(c)	Ch-1	4
2	(c)	Ch-3	15
3	(b)	Ch-4	S-151
4	(d)	Ch-4	22
5	(b)	Ch-8	36
6	(b)	Ch-4	40
7	(a)	Ch-6	26
8	(a)	Ch-1	S-11
9	(a)	Ch-3	10
10	(b)	Ch-5	38
11	(a)	Ch-2	6
12	(c)	Ch-1	32
13	(b)	Ch-6	75
14	(a)	Ch-6	39
15	(d)	Ch-7	22
16	(c)	Ch-4	63
17	(a)	Ch-4	36
18	(a)	Ch-6	S-21
19	(b)	Ch-3	39
20	(a)	Ch-8	39
21	(d)	Ch-1	56
22	(b)	Ch-5	73
23	(d)	Ch-6	113
24	(a)	Ch-3	D-72
25	(d)	Ch-2	13

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(b)	Ch-8	133
27	(b)	Ch-8	74
28	(b)	Ch-6	S-8
29	(a)	Ch-5	S-18
30	(c)	Ch-4	130
31	(b)	Ch-5	62
32	(a)	Ch-6	108
33	(c)	Ch-1	S-23
34	(c)	Ch-4	87
35	(c)	Ch-5	106
36	(a)	Ch-7	S-10
37	(a)	Ch-7	S-20
38	(d)	Ch-2	S-27(D)
39	(b)	Ch-7	S-30
40	(c)	Ch-3	88
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	(a)	Ch-1	86
47	(d)	Ch-1	87
48	(c)	Ch-1	88
49	(a)	Ch-1	89
50	(c)	Ch-1	90

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