

Sample/Pre-Board Paper 14
Class X Term 1 Exam Nov -Dec 2021
Mathematics (Standard) 041

Time Allowed: 90 minutes Maximum Marks: 40

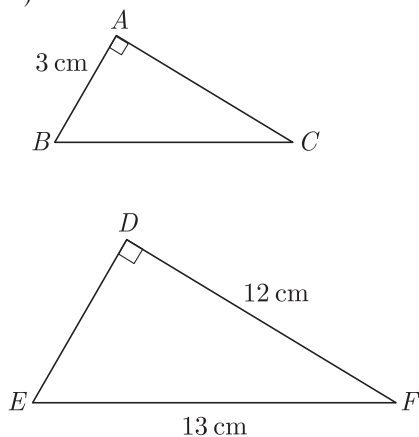
General Instructions:

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 sum of exponents of prime factors in the prime-factorisation of 1764 is
(a) 3 (b) 4
(c) 5 (d) 6
2. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is
(a) $-\frac{5}{4}$ (b) $\frac{2}{5}$
(c) $\frac{15}{4}$ (d) $\frac{3}{2}$
3. $\triangle ABC$ 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°
4. Given $\triangle ABC \sim \triangle DEF$, what is the ratio of $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle DEF)}$
5. If in a lottery, there are 5 prizes and 20 blanks, then the probability of getting a prize is
(a) $\frac{2}{5}$ (b) $\frac{4}{5}$
(c) $\frac{1}{5}$ (d) 1
6. If triangle ABC is similar to triangle DEF such that $2AB = DE$ and $BC = 8$ cm then EF will be
(a) 16 cm (b) 14 cm
(c) 12 cm (d) 10 cm
7. The value of the $(\tan^2 60^\circ + \sin^2 45^\circ)$ is
(a) $\frac{1}{2}$ (b) $\frac{3}{2}$
(c) 1 (d) $\frac{7}{2}$
8. Which of the following rational number have non-terminating repeating decimal expansion?
(a) $\frac{31}{3125}$ (b) $\frac{71}{512}$
(c) $\frac{23}{200}$ (d) None of these
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. The distance of a point $P(x, y)$ from the origin is
(a) $\sqrt{x^2 - xy + y^2}$ (b) $\sqrt{x^2 + xy + y^2}$
(c) $\sqrt{x^2 + y^2}$ (d) $\sqrt{x^2 + 3xy + y^2}$
11. If sum of the zeroes of the quadratic polynomial $3x^2 - kx + 6$ is 3, then the value of k will be
(a) 1 (b) 4
(c) 6 (d) 9



- (a) 3 : 4
- (b) 9 : 25
- (c) 9 : 16
- (d) 1 : 16

12. Given that $\text{HCF}(306, 1314) = 18$. What is the LCM $(306, 1314)$

(a) 22338 (b) 11164
(c) 16146 (d) 19248

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

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

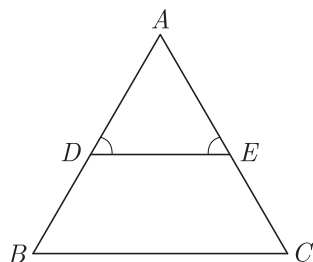
14. $\frac{\sin 90^\circ}{\cos 45^\circ} + \frac{1}{\operatorname{cosec} 30^\circ}$ is equal to

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

15. In a circle of radius 14 cm, an arc subtends an angle of 45° at the centre, then the area of the sector is

(a) 71 cm^2 (b) 76 cm^2
(c) 77 cm^2 (d) 154 cm^2

16. In Figure $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$, then $\triangle BAC$ is



(a) isosceles triangle (b) scalene triangle
(c) equilateral triangle (d) right angle triangle

17. Vertical angles of two isosceles triangles are equal. If their areas are in the ratio $16:25$, then the ratio of their altitudes drawn from vertex to the opposite side will be

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

18. If $4\tan\theta = 3$, $\left(\frac{4\sin\theta - \cos\theta + 1}{4\sin\theta + \cos\theta - 1}\right) = ?$

(a) $\frac{11}{13}$ (b) $\frac{11}{15}$
(c) $\frac{13}{11}$ (d) $\frac{15}{11}$

19. Given the linear equation $2x + 3y - 8 = 0$, select another linear equation in two variables such that the geometrical representation of the pair so formed is parallel lines.

(a) $5x + 2y - 9 = 0$ (b) $6x + 9y + 7 = 0$
(c) $4x + 6y - 16 = 0$ (d) above all

20. On a single roll of a die, the probability of getting a number 8 is

(a) 0.5 (b) 0.4
(c) 1 (d) 0

SECTION B

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

21. The length, breadth and height of a room are 8 m 50 cm, 6 m 25 cm and 4 m 75 cm respectively. What is the length of the longest rod that can measure the dimensions of the room exactly?

(a) 10 cm (b) 25 cm
(c) 50 cm (d) 75 cm

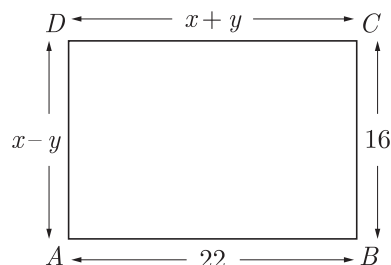
22. If the points $A(4, 3)$ and $B(x, 5)$ are on the circle with centre $O(2, 3)$, then the value of x is

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

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

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

24. 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

25. If m and n are the zeroes of the polynomial $3x^2 + 11x - 4$, then value of $\frac{m}{n} + \frac{n}{m}$ will be

(a) $\frac{12}{145}$ (b) $-\frac{12}{145}$
(c) $-\frac{145}{12}$ (d) $\frac{145}{12}$

26. What is the probability that 5 Sundays occur in the month of November of a randomly selected year.

- (a) $\frac{5}{7}$ (b) $\frac{2}{7}$
(c) $\frac{4}{7}$ (d) $\frac{3}{7}$

27. A game consists of tossing a coin 3 times and noting the outcome each time. If getting the same result in all the tosses is a success, what is the probability of losing the game?

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

28. Given that $\sin(A + 2B) = \frac{\sqrt{3}}{2}$ and $\cos(A + 4B) = 0$, where A and B are acute angles. The value of A is

- (a) 30°
(b) 45°
(c) 60°
(d) 90°

29. If the vertices of ΔABC are $A(5, -1)$, $B(-3, -2)$, $C(-1, 8)$, the length of median through A will be

- (a) $\sqrt{65}$
(b) $\sqrt{55}$
(c) $\sqrt{45}$
(d) $\sqrt{35}$

30. ABC is a triangle, PQ is the line segment intersecting AB in P and AC in Q such that $PQ \parallel BC$ and divides ΔABC into two parts, the ratio $BP:AB$ is equal to

- (a) $(\sqrt{2} - 1) : \sqrt{2}$
(b) $(\sqrt{2} + 1) : \sqrt{2}$
(c) $\sqrt{2} : (\sqrt{2} + 1)$
(d) $\sqrt{2} : (\sqrt{2} - 1)$

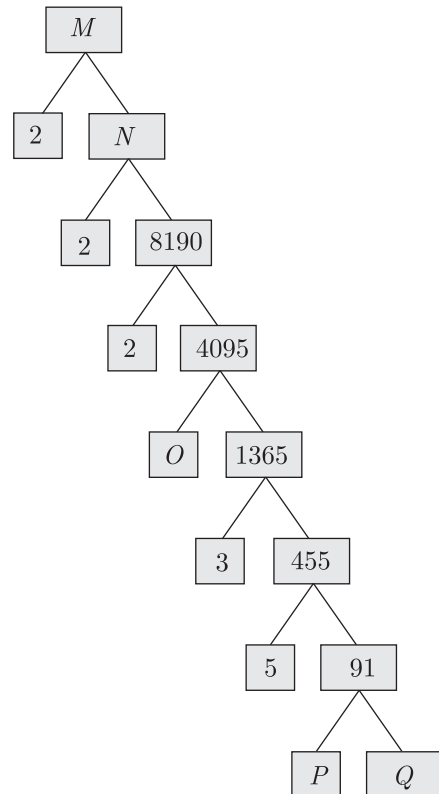
31. Point A lies on the line segment XY joining $X(6, -6)$ and $Y(-4, -1)$ in such a way that $\frac{XA}{XY} = \frac{2}{5}$. If point A also lies on the line $3x + k(y + 1) = 0$, the value of k is

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

32. $2 + \frac{\sin \theta}{\cot \theta - \operatorname{cosec} \theta} = ?$

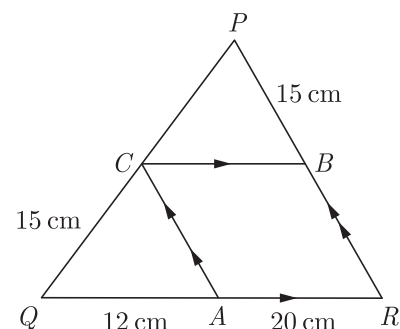
- (a) $1 - \cos \theta$
(b) $1 + \cos \theta$
(c) $1 + \sin \theta$
(d) $1 - \sin \theta$

33. In the given factor tree what is the composite number M ?



- (a) 16380 (b) 32760
(c) 16190 (d) 32380

34. In the given figure below, $CB \parallel QR$ and $CA \parallel PR$. Also $AQ = 12$ cm, $AR = 20$ cm, $PB = CQ = 15$ cm. Calculate PC and BR .



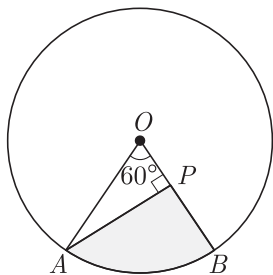
The length PC is

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

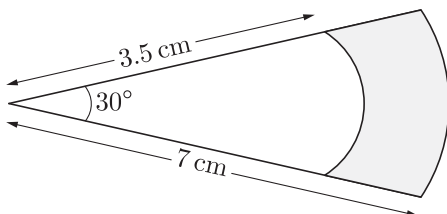
35. If $(3, 2)$ and $(-3, 2)$ are two vertices of an equilateral triangle which contains the origin, the third vertex will be

- (a) $(1, 2 - \sqrt{3})$
(b) $(2, 1 - 3\sqrt{3})$
(c) $(0, 2 - 3\sqrt{3})$
(d) $(1, 2 - \sqrt{3})$

36. In the given figure, AOB is a sector of angle 60° of a circle with centre O and radius 17 cm. If $AP \perp OB$ and $AP = 15$ cm, what is the area of the shaded region?



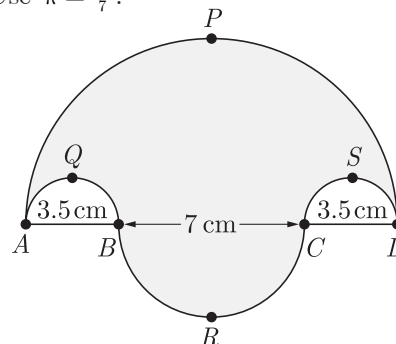
- (a) 60.5 cm^2 (b) 126 cm^2
(c) 91.4 cm^2 (d) 78 cm^2
37. In the given figure sectors of two concentric circles of radii 7 cm and 3.5 cm are given. What is the area of shaded region? Use $\pi = \frac{22}{7}$.



- (a) 9.62 cm^2 (b) 18.14 cm^2
(c) 21.34 cm^2 (d) 11.68 cm^2

38. If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of $2x^2 - 5x - 3$, the value of p and q will be
- (a) -2 and -3 (b) -6 and -5
(c) -5 and -6 (d) -3 and -2

39. In the given figure \widehat{APD} , \widehat{AQB} , \widehat{BRC} and \widehat{CSD} , are semi-circles of diameter 14 cm, 3.5 cm, 7 cm and 3.5 cm respectively. What is the area of the shaded region? Use $\pi = \frac{22}{7}$.



- (a) 98.8 cm^2 (b) 86.6 cm^2
(c) 78.4 cm^2 (d) 50.6 cm^2
40. A man can row a boat downstream 20 km in 2 hours and upstream 4 km in 2 hours. What is his speed of rowing in still water ?
- (a) 2 km/hr (b) 3 km/hr
(c) 6 km/hr (d) 8 km/hr

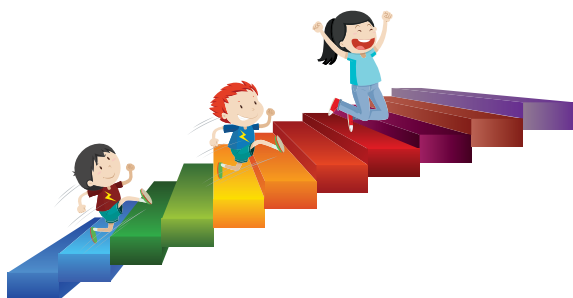
SECTION C

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)

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.



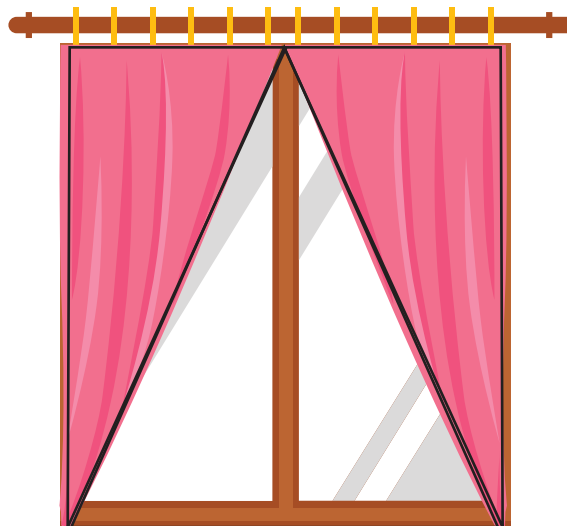
Doing this they have to reach to the nearest point of 100th stairs and they will stop once they find it impossible to go forward. They can not cross 100th stair in anyway.

41. Who reaches the nearest point?
- (a) Amar
(b) Akbar
(c) Anthony
(d) All together reach to the nearest point.
42. 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.

43. Who takes least number of steps to reach near hundred?
- Amar
 - Akbar
 - Anthony
 - All of them take equal number of steps.
44. What is the first stair where any two out of three will meet together?
- Amar and Akbar will meet for the first time on 15th stair.
 - Akbar and Anthony will meet for the first time on 35th stair.
 - Amar and Anthony will meet for the first time on 21th stair.
 - Amar and Akbar will meet for the first time on 21th stair.
45. What is the second stair where any two out of three will meet together?
- Amar and Akbar will meet on 21th stair.
 - Akbar and Anthony will meet on 35th stair.
 - Amar and Anthony will meet on 21th stair.
 - Amar and Anthony will meet on 35th stair.

Case Based Questions: (46-50)

Rani wants to make the curtains for her window as shown in the figure. The window is in the shape of a rectangle, whose width and height are in the ratio 2:3. The area of the window is 9600 square cm.



46. What is the shape of the window that is uncovered?
- Right triangle
 - Equilateral triangle
 - Isosceles triangle
 - Rectangle
47. What will be the ratio of two sides of each curtain (other than hypotenuse) ?
- 1 : 3
 - 2 : 3
 - 1 : 1
 - 3 : 2
48. What are the dimensions of the window ?
- 40 cm \times 80 cm
 - 20 cm \times 60 cm
 - 80 cm \times 120 cm
 - 40 cm \times 120 cm
49. What will be the perimeter of the window ?
- 200 cm
 - 100 cm
 - 400 cm
 - 450 cm
50. How much window area is covered by the curtains?
- 50%
 - 75%
 - 25%
 - 80%

SAMPLE PAPER - 9 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(d)	Ch-1	33
2	(c)	Ch-3	16
3	(d)	Ch-4	30
4	(b)	Ch-4	61
5	(c)	Ch-8	23
6	(a)	Ch-4	35
7	(d)	Ch-6	25
8	(d)	Ch-1	21
9	(b)	Ch-3	31
10	(c)	Ch-5	39
11	(d)	Ch-2	31
12	(a)	Ch-1	S-18
13	(b)	Ch-6	50
14	(a)	Ch-6	S-14
15	(c)	Ch-7	14
16	(a)	Ch-4	36
17	(d)	Ch-4	S-132
18	(c)	Ch-6	96
19	(b)	Ch-3	S-4
20	(d)	Ch-8	31
21	(b)	Ch-1	S-19
22	(c)	Ch-5	17
23	(c)	Ch-6	99
24	(b)	Ch-3	39
25	(c)	Ch-2	S-5

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(b)	Ch-8	81
27	(d)	Ch-8	87
28	(a)	Ch-6	95
29	(a)	Ch-5	55
30	(a)	Ch-4	S-124
31	(a)	Ch-5	91
32	(a)	Ch-6	94
33	(b)	Ch-1	S-5
34	(b)	Ch-4	D-57
35	(c)	Ch-5	53
36	(c)	Ch-7	56
37	(a)	Ch-7	67
38	(c)	Ch-2	S-19
39	(b)	Ch-7	78
40	(c)	Ch-3	D-62
41	(a)	Ch-1	86
42	(d)	Ch-1	87
43	(c)	Ch-1	88
44	(a)	Ch-1	89
45	(c)	Ch-1	90
46	(c)	Ch-4	110
47	(a)	Ch-4	111
48	(d)	Ch-4	112
49	(c)	Ch-4	113
50	(a)	Ch-4	114

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