# 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.

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# 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) $\frac{2}{5}$

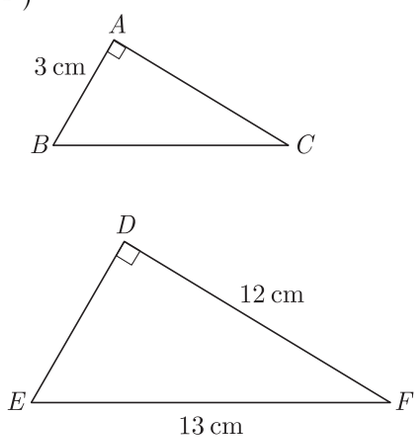
(c) $\frac{15}{4}$ (d) $\frac{3}{2}$

**3.** $\Delta ABC$ is isosceles with $AC=BC$. If $AB^2=2AC^2$, then the measure of $\angle C$ will be

(a) $30^\circ$ (b) $60^\circ$

(c) $45^\circ$ (d) $90^\circ$

**4.** Given $\Delta ABC \sim \Delta DEF$, what is the ratio of $\frac{\text{ar}(\Delta ABC)}{\text{ar}(\Delta DEF)}$




(a) 3 : 4

(b) 9 : 25

(c) 9 : 16

(d) 1 : 16

**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

**12.** Given that 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.** $\frac{\sin 90^\circ}{\cos 45^\circ}+\frac{1}{\text{cosec}\,30^\circ}$ is equal to

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

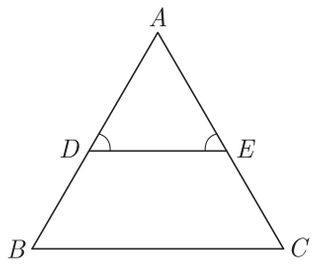
(c) $2+\sqrt{2}$ (d) $1+\sqrt{2}$

**15.** In a circle of radius 14 cm, an arc subtends an angle of $45^\circ$ at the centre, then the area of the sector is

(a) 71 $\text{cm}^2$ (b) 76 $\text{cm}^2$

(c) 77 $\text{cm}^2$ (d) 154 $\text{cm}^2$

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

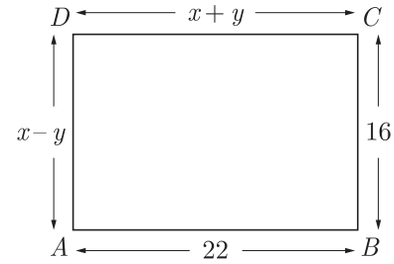
(c) 2 (d) 3

**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 $\Delta ABC$ 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 $PQ \,||\, BC$ and divides $\Delta ABC$ 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.** $2+\dfrac{\sin\theta}{\cot\theta-\operatorname{cosec}\theta}=?$

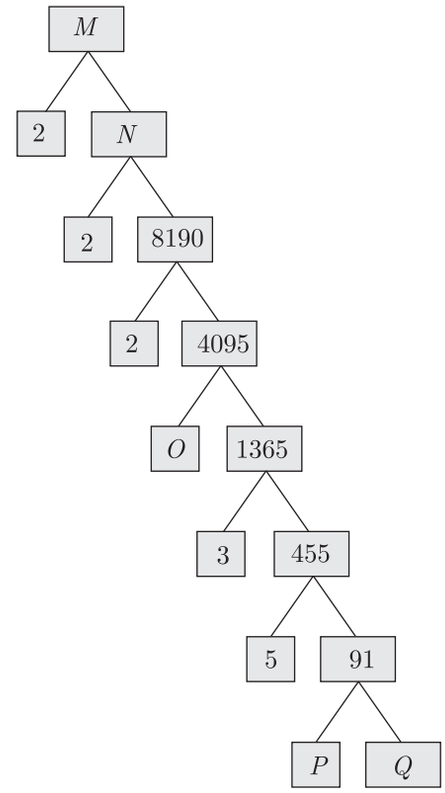
(a) $1-\cos\theta$

(b) $1+\cos\theta$

(c) $1+\sin\theta$

(d) $1-\sin\theta$

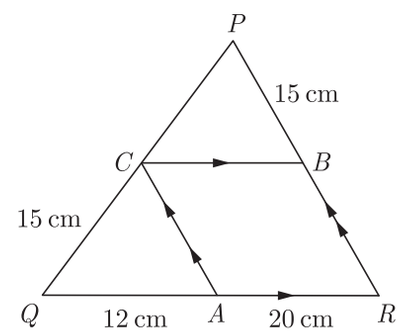
**33.** In the given factor tree what is the composite number $M$?




(a) 16380 (b) 32760

(c) 16190 (d) 32380

**34.** In the given figure below, $CB \,||\, QR$ and $CA \,||\, PR$. 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

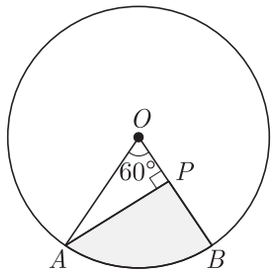
(a) $\left(1,\ 2-\sqrt{3}\right)$

(b) $\left(2,\ 1-3\sqrt{3}\right)$

(c) $\left(0,\ 2-3\sqrt{3}\right)$

(d) $\left(1,\ 2-\sqrt{3}\right)$

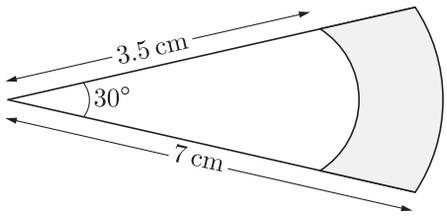
**36.** In the given figure, $AOB$ is a sector of angle $60^\circ$ of a circle with centre $O$ and radius 17 cm. If $AP \perp OB$ and $AP = 15$ cm, what is the area of the shaded region?




(a) $60.5\ \text{cm}^2$ (b) $126\ \text{cm}^2$

(c) $91.4\ \text{cm}^2$ (d) $78\ \text{cm}^2$

**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) $9.62\ \text{cm}^2$ (b) $18.14\ \text{cm}^2$

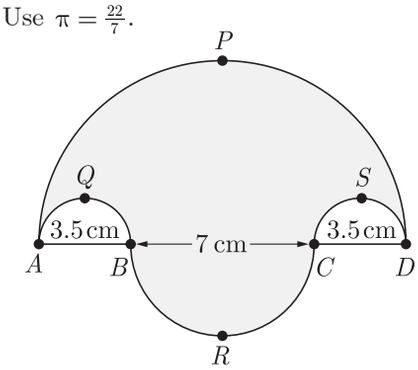
(c) $21.34\ \text{cm}^2$ (d) $11.68\ \text{cm}^2$

**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 $\overset{\frown}{APD}, \overset{\frown}{AQB}, \overset{\frown}{BRC}$ and $\overset{\frown}{CSD}$, 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) $98.8\ \text{cm}^2$ (b) $86.6\ \text{cm}^2$

(c) $78.4\ \text{cm}^2$ (d) $50.6\ \text{cm}^2$

**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?

(a) Amar

(b) Akbar

(c) Anthony

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

**44.** 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.

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

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

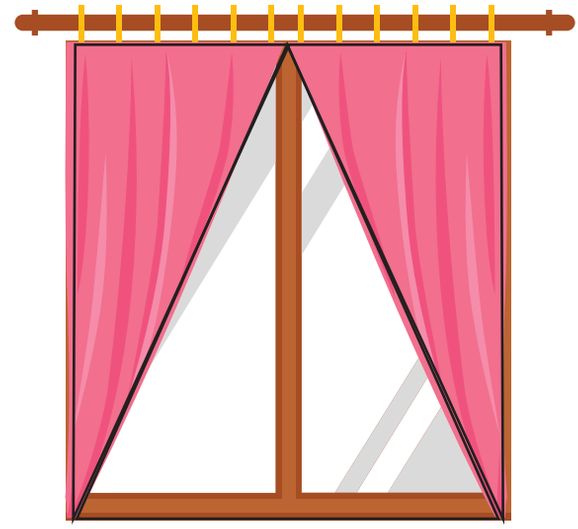
(b) Akbar and Anthony will meet on 35th stair.

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

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

**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?

(a) Right triangle (b) Equilateral triangle

(c) Isosceles triangle (d) Rectangle

**47.** What will be the ratio of two sides of each curtain (other than hypotenuse) ?

(a) 1 : 3 (b) 2 : 3

(c) 1 : 1 (d) 3 : 2

**48.** What are the dimensions of the window ?

(a) 40 cm $\times$ 80 cm (b) 20 cm $\times$ 60 cm

(c) 80 cm $\times$ 120 cm (d) 40 cm $\times$ 120 cm

**49.** What will be the perimeter of the window ?

(a) 200 cm (b) 100 cm

(c) 400 cm (d) 450 cm

**50.** How much window area is covered by the curtains?

(a) 50% (b) 75%

(c) 25% (d) 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**