Sunrise Academy

Pre-Board Examination 2026-27

Date: 15 Jan 2027 | **Class X · Mathematics** | Duration: 180 Minutes | Max. Marks: 80

Section A — 1 Mark Questions

Q1. In an AP if $a = -7.2$, $d = 3.6$, $a_n = 7.2$, then n is

(A) 1 **(B)** 3

(C) 4 **(D)** 5

Q2. A die is thrown once. The probability of getting a number less than 7 is

(A) 0 **(B)** $\frac{5}{6}$

(C) 1 **(D)** $\frac{1}{6}$

Q3. [CBSE 2023] PQ is a tangent at B to a circle centred at O, and A is another point of the circle. If $\angle AOB = 95^\circ$, then the measure of $\angle ABQ$ (on the side of A) is

(A) 47.5° **(B)** 42.5°

(C) 85° **(D)** 95°

Q4. [CBSE 2023] For the following distribution :

Marks Below	10	20	30	40	50	60
Number of Students	3	12	27	57	75	80

The modal class is :

(A) 10-20 **(B)** 20-30

(C) 30-40 **(D)** 50-60

Q5. [CBSE 2023] The next term of the A.P. : $\sqrt{7}, \sqrt{28}, \sqrt{63}$ is :

(A) $\sqrt{70}$ **(B)** $\sqrt{80}$

(C) $\sqrt{97}$ **(D)** $\sqrt{112}$

Q6. The LCM of 12, 15 and 21 is

(A) 1260 **(B)** 420

(C) 3780 **(D)** 210

Q7. If α, β, γ are the zeroes of $ax^3 + bx^2 + cx + d$, then $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma}$ equals

(A) $-\frac{c}{d}$ **(B)** $\frac{c}{d}$

(C) $-\frac{b}{d}$ **(D)** $\frac{c}{a}$

Q8. The HCF of 26 and 91 is

(A) 7 **(B)** 13

(C) 26 **(D)** 182

Q9. Which of the following is irrational?

(A) $\sqrt{16}$ **(B)** $\sqrt{0.09}$

(C) $\sqrt{12}$ **(D)** $\frac{22}{7}$

Q10. $(2+\sqrt{3})(2-\sqrt{3})$ is

(A) rational **(B)** irrational

(C) negative **(D)** zero

Q11. The point on the x-axis equidistant from $(1, 3)$ and $(5, 1)$ is

(A) $(2, 0)$ **(B)** $(3, 0)$

(C) $(4, 0)$ **(D)** $(1, 0)$

Q12. At some time of the day, the length of the shadow of a pole is equal to its height. The sun's altitude then is

(A) 30° **(B)** 45°

(C) 60° **(D)** 90°

Q13. [CBSE 2024] The perimeter of the sector of a circle of radius 21 cm which subtends an angle of 60° at the centre of circle, is

(A) 22 cm **(B)** 43 cm

(C) 64 cm **(D)** 462 cm

Q14. When the sun's elevation is 60°, the shadow of a 5 m pole is

(A) $5\sqrt{3}$ m **(B)** 5 m

(C) $\frac{5}{\sqrt{3}}$ m **(D)** 10 m

Q15. A 12 m tree casts a shadow $4\sqrt{3}$ m long. The sun's elevation is

(A) 30° **(B)** 45°

(C) 60° **(D)** 90°

Q16. [CBSE 2023] A box contains 90 discs, numbered from 1 to 90. If one disc is drawn at random from the box, the probability that it bears a prime number less than 23 is

(A) $\frac{7}{90}$ **(B)** $\frac{1}{9}$

(C) $\frac{4}{45}$ **(D)** $\frac{9}{89}$

Q17. Volumes of two spheres are in the ratio 64 : 27. The ratio of their surface areas is

(A) 3 : 4 **(B)** 4 : 3

(C) 9 : 16 **(D)** 16 : 9

Q18. A capsule is a cylinder of length 10 mm and radius 3.5 mm with a hemisphere at each end. Its total length is

(A) 13.5 mm **(B)** 10 mm

(C) 17 mm **(D)** 20.5 mm

Q19. The 21st term of the AP whose first two terms are -3 and 4 is

(A) 17 **(B)** 137

(C) 143 **(D)** -143

Q20. Assertion (A): If the shadow of a tower is 40 m longer at sun's altitude 30° than at 60°, the tower is $20\sqrt{3}$ m high.
Reason (R): Shadow length $= h\cot\theta$, so the difference is $h(\cot 30^\circ - \cot 60^\circ) = \frac{2h}{\sqrt{3}}$.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but Reason (R) is false.

(D) Assertion (A) is false but Reason (R) is true.

Q21. Assertion (A): The top of a 20 m tower is seen at 30° from a point $20\sqrt{3}$ m from its foot.
Reason (R): The distance is $h\cot\theta$.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but Reason (R) is false.

(D) Assertion (A) is false but Reason (R) is true.

Section B — 2 Marks Questions

Q1. [CBSE 2025] A bag contains balls numbered 2 to 91 such that each ball bears a different number. A ball is drawn at random from the bag. Find the probability that
(i) it bears a 2-digit number
(ii) it bears a multiple of 1.

Q2. An observer 1.5 metres tall is 20.5 metres away from a tower 22 metres high. Determine the angle of elevation of the top of the tower from the eye of the observer.

Q3. [CBSE 2025] Find the value(s) of k for which the quadratic equation $4x^2 + kx + 1 = 0$ has real and equal roots.

Q4. In $\triangle ABC$, D and E are points on sides AB and AC with $DE \parallel BC$. If $AD = 4$ cm, $DB = 4.5$ cm and $AE = 8$ cm, find AC.

Q5. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - x - 4$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$.

Section C — 3 Marks Questions

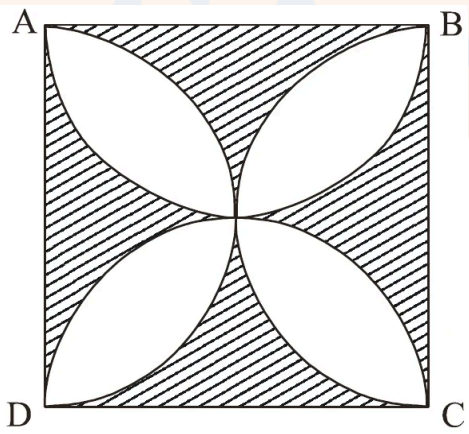
Q1. The mileage (km per litre) of 50 cars of the same model was tested by a manufacturer and details are tabulated as given below. Find the mean mileage. The manufacturer claimed that the mileage of the model was 16 km/litre. Do you agree with this claim?

Mileage (km/l)	**10 – 12**	**12 – 14**	**14 – 16**	**16 – 18**
Number of cars	7	12	18	13

Q2. [CBSE 2026] Find the area of the sector of a circle of radius 42 cm and of central angle $30°$. Also, find the area of the corresponding major sector. $\left[\text{Use } \pi = \frac{22}{7}\right]$

Q3. [CBSE 2026] Two dice of different colours are thrown at the same time. Write down all the possible outcomes. What is the probability that :
(i) same number appears on both the dice ?
(ii) different number appears on both the dice ?

Q4. [CBSE 2016] In Fig. 4, ABCD is a square of side 14 cm. Semi-circles are drawn with each side of square as diameter. Find the area of the shaded region. $\left(\text{use } \pi = \frac{22}{7}\right)$



Q5. Prove that $3 + 2\sqrt{5}$ is irrational.

Q6. Find the zeroes of the following polynomial by factorisation method and verify the relations between the zeroes and the coefficients of the polynomial: $3x^2 + 4x - 4$

Q7. The length of a rectangular hall is 4 m more than its breadth, and the perimeter of the hall is 40 m.

(a) Taking length l and breadth b, the equations are

(A) $b = l + 4$ and $l + b = 40$
(B) $l = b + 4$ and $2(l + b) = 40$
(C) $l = 4b$ and $2(l + b) = 40$
(D) $l - b = 40$ and $l + b = 4$

(b) The breadth of the hall is

(A) 6 m **(B)** 10 m

(C) 8 m **(D)** 12 m

(c) The area of the hall is

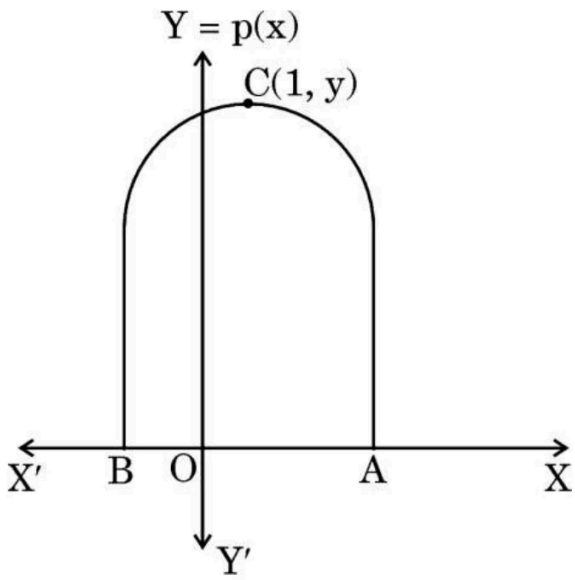
(A) 80 m² **(B)** 120 m²

(C) 144 m² **(D)** 96 m²

Section D — 4 Marks Questions

Q1. [CBSE 2026] During a theatre drama, a backdrop of building arches was used. The shape of the curve shown below can be represented by the polynomial $p(x) = -x^2 + 2x + 8$, where x is the length (in feet) on stage level.





Based on the figure given above, answer the following questions :

(a) (i) Determine the height of the arch.

(b) (ii) (a) Find zeroes of the polynomial $p(x)$. Which points on the graph represent the zeroes ?

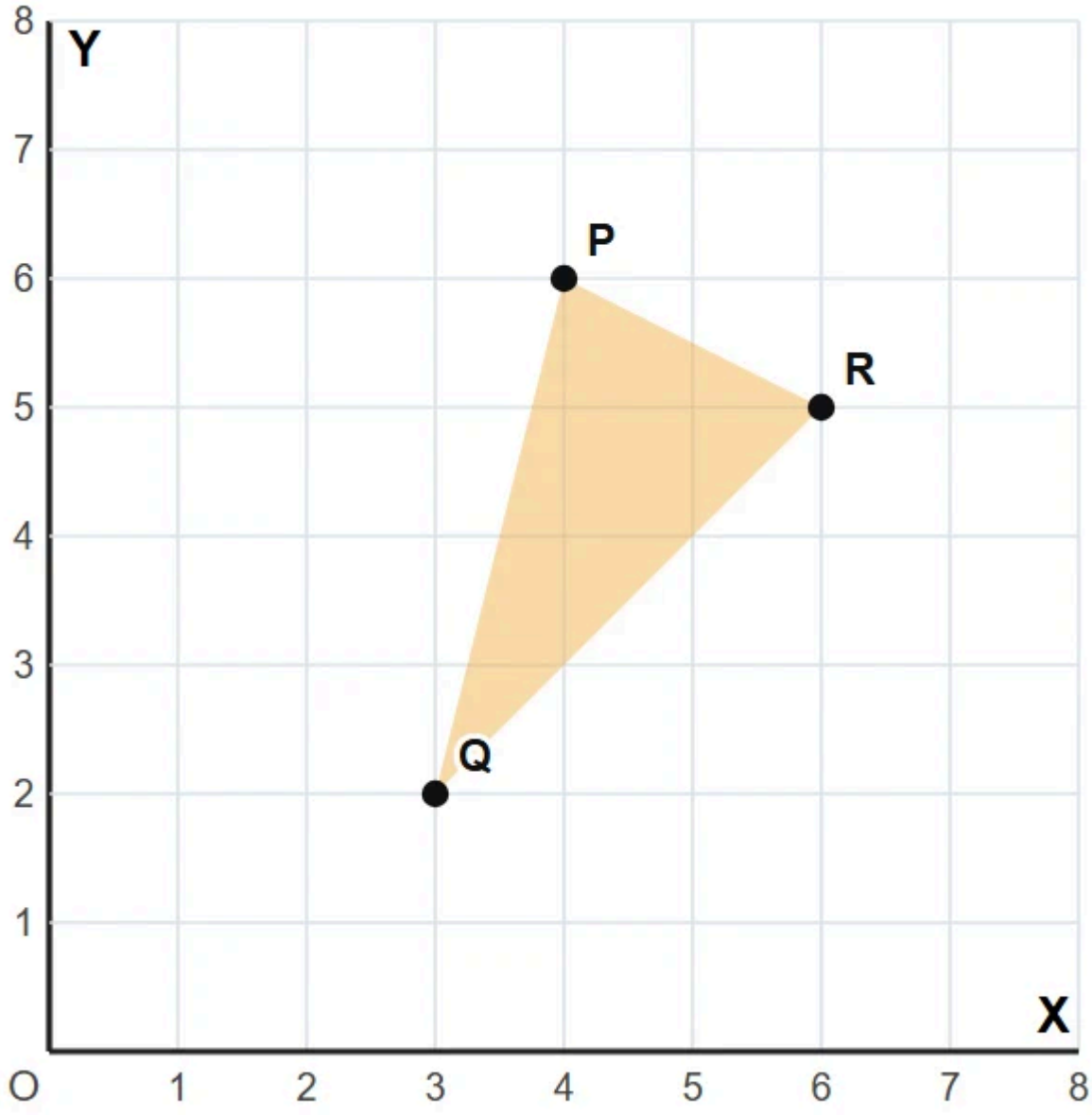
OR

(ii) (b) Find the span of the arch on the stage floor.

(c) (iii) Write the coordinates of the point of intersection of the above curve with the y-axis.

Q2. [CBSE 2024] A garden is in the shape of a square. The gardener grew saplings of Ashoka tree on the boundary of the garden at the distance of 1 m from each other. He wants to decorate the garden with rose plants. He chose a triangular region inside the garden to grow rose plants. In the above situation, the gardener took help from the students of class 10. They made a chart for it

which looks like the given figure.



(a) If A is taken as origin, what are the coordinates of the vertices of $\triangle PQR$?

(b) (a) Find distances PQ and QR. OR (b) Find the coordinates of the point which divides the line segment joining points P and R in the ratio $2:1$ internally.

(c) Find out if $\triangle PQR$ is an isosceles triangle.

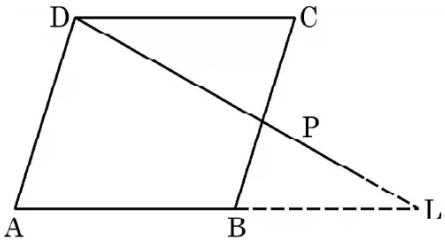
Section E — 5 Marks Questions

Q1. [CBSE 2023] ABCD is a parallelogram, P is a point on side BC and DP when produced meets AB produced at L. Prove that

(i) $\frac{DP}{PL} = \frac{DC}{BL}$

(ii) $\frac{DL}{DP} = \frac{AL}{DC}$

(iii) If LP : PD = 2 : 3 then find BP : BC.



Q2. [CBSE 2024] In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100 km/h and by doing so, the time of flight is increased by 30 minutes. Find the original duration of the flight.

Q3. [CBSE 2023] From the top of a tower 100 m high, a man observes two cars on the opposite sides of the tower with angles of depression 30° and 45° respectively. Find the distance between the two cars. (Use $\sqrt{3}$ = 1·73)

Q4. [CBSE 2024] From the top of a 15 m high building, the angle of elevation of the top of a tower is found to be $30°$. From the bottom of the same building, the angle of elevation of the top of the tower is found to be $60°$. Find the height of the tower and the distance between tower and the building.

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Question Paper Blueprint

Section	No. of Questions	Total Marks
Section A — 1 Mark	21	21
Section B — 2 Marks	5	10
Section C — 3 Marks	7	21
Section D — 4 Marks	2	8
Section E — 5 Marks	4	20
Total	**39**	**80**

Wishing you all the best!

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