jeeinfo
Your JEE Guide

CBSE Class X · Mathematics Standard (041)

Sample Question Paper 3 · Session 2026-27

Time allowed: 3 hours **Maximum marks: 80**

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission.
This is an original practice paper written to the official CBSE 2026-27 design; it is not issued by CBSE.

General instructions:

1. This question paper contains 38 questions. All questions are compulsory.
2. This question paper is divided into five Sections: A, B, C, D and E.
3. In Section A, Questions 1 to 18 are multiple choice questions (MCQs) and Questions 19 and 20 are Assertion–Reason based questions of 1 mark each.
4. In Section B, Questions 21 to 25 are very short answer (VSA) type questions carrying 2 marks each.
5. In Section C, Questions 26 to 31 are short answer (SA) type questions carrying 3 marks each.
6. In Section D, Questions 32 to 35 are long answer (LA) type questions carrying 5 marks each.
7. In Section E, Questions 36 to 38 are case study based questions carrying 4 marks each.
8. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D, and in the 2-mark sub-parts of Section E.
9. Draw neat figures wherever required. Take π = 22/7 wherever required, if not stated.
10. Use of calculators is not allowed.

Section A

1.	The product of the HCF and LCM of 18 and 24 is: (A) 216 (B) 432 (C) 144 (D) 72	1
2.	If p and q are two distinct prime numbers, their HCF is: (A) 1 (B) p + q (C) pq (D) p	1
3.	The graph of a polynomial y = p(x) meets the x-axis at exactly three points. The number of zeroes of p(x) is: (A) 2 (B) 1 (C) 0 (D) 3	1
4.	If α and β are the zeroes of $x^2 + 5x + 6$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ is: (A) $\frac{5}{6}$ (B) $\frac{6}{5}$ (C) $-\frac{5}{6}$ (D) $-\frac{6}{5}$	1

5.	The lines $2x - 3y = 5$ and $4x - 6y = 7$ are: (A) intersecting at exactly one point (B) coincident (C) perpendicular (D) parallel	1
6.	The discriminant of $3x^2 - 4\sqrt{3}x + 4 = 0$ is: (A) 96 (B) 0 (C) –48 (D) 48	1
7.	Which of the following is an AP? (A) 2, 5, 8, 11, … (B) 2, 4, 8, 16, … (C) 1, 4, 9, 16, … (D) 1, 3, 4, 7, …	1
8.	The nth term of the AP 7, 11, 15, … is: (A) 7n + 4 (B) 4n + 7 (C) 4n + 3 (D) 3n + 4	1
9.	If the distance between P(x, 4) and Q(3, 0) is 5 units, a possible value of x is: (A) 6 (B) 4 (C) 5 (D) –2	1
10.	The point on the x-axis equidistant from (2, –5) and (–2, 9) is: (A) (–3, 0) (B) (0, –7) (C) (–7, 0) (D) (7, 0)	1
11.	$9\sec^2 A - 9\tan^2 A$ is equal to: (A) 8 (B) 1 (C) 0 (D) 9	1
12.	If $\tan\theta = \sqrt{3}$ and θ is acute, then $\sin\theta$ is: (A) 1 (B) $\frac{\sqrt{3}}{2}$ (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$	1
13.	The angle of elevation of the top of a 30 m high tower from a point $30\sqrt{3}$ m from its foot is: (A) 60° (B) 45° (C) 30° (D) 90°	1
14.	$\triangle ABC \sim \triangle PQR$ with $\angle A = 50^\circ$ and $\angle Q = 60^\circ$. Then $\angle C$ is: (A) 70° (B) 60° (C) 50° (D) 110°	1
15.	The number of tangents that can be drawn to a circle from a point outside it is: (A) 1 (B) 2 (C) 0 (D) infinitely many	1

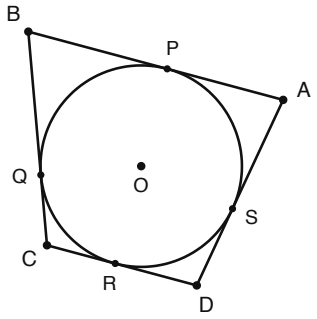
© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

16.	The area of a quadrant of a circle whose circumference is 22 cm is: (use $\pi = \frac{22}{7}$) (A) $\frac{77}{4}$ cm² (B) $\frac{77}{2}$ cm² (C) $\frac{11}{2}$ cm² (D) $\frac{77}{8}$ cm²	1
17.	The total surface area of a solid hemisphere of radius r is: (A) $2\pi r^2$ (B) $4\pi r^2$ (C) πr^2 (D) $3\pi r^2$	1
18.	If P(E) = 0.05, then P(not E) is: (A) 0.05 (B) 0.95 (C) 0.5 (D) 1.05	1
19.	**Assertion (A):** The point (3, –4) lies in the second quadrant. **Reason (R):** A point with a positive x-coordinate and a negative y-coordinate lies in the fourth quadrant. (A) Both Assertion (A) and Reason (R) are true and R is the correct explanation of A. (B) Both A and R are true but R is not the correct explanation of A. (C) A is true but R is false. (D) A is false but R is true.	1
20.	**Assertion (A):** HCF(12, 18) = 6. **Reason (R):** 12 and 18 are both even numbers. (A) Both Assertion (A) and Reason (R) are true and R is the correct explanation of A. (B) Both A and R are true but R is not the correct explanation of A. (C) A is true but R is false. (D) A is false but R is true.	1

Section B

21.	Find the HCF and LCM of 72 and 120 by prime factorisation.	2
22.	Find a quadratic polynomial whose zeroes are $2 + \sqrt{3}$ and $2 - \sqrt{3}$. **OR** Solve by substitution: $3x + 4y = 10$ and $2x - 2y = 2$.	2
23.	Find the coordinates of the points of trisection of the line segment joining (2, –2) and (–7, 4).	2

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

24.	A quadrilateral ABCD is drawn to circumscribe a circle (see figure). Prove that AB + CD = AD + BC.  **OR** In the same figure, if AB = 6 cm, BC = 7 cm and CD = 4 cm, find AD.	2
25.	Prove that $(\sin\theta + \cos\theta)^2 + (\sin\theta - \cos\theta)^2 = 2$.	2

Section C

26.	Prove that $\sqrt{2}$ is irrational.	3
27.	If α and β are the zeroes of $p(x) = x^2 - 5x + 6$, find the values of (i) $\alpha^2 + \beta^2$ and (ii) $\frac{1}{\alpha} + \frac{1}{\beta}$.	3
28.	A shopkeeper sells 2 pens and 3 notebooks for ₹110, and 4 pens and 1 notebook for ₹70. Find the price of one pen and of one notebook.	3
29.	Prove that a parallelogram circumscribing a circle is a rhombus. **OR** Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.	3
30.	Prove that $(\operatorname{cosec}\theta - \cot\theta)^2 = \dfrac{1-\cos\theta}{1+\cos\theta}$. **OR** Prove that $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$.	3
31.	Find the mode of the following data: Class: 0–10 | 10–20 | 20–30 | 30–40 | 40–50 Frequency: 5 | 8 | 12 | 7 | 3	3

Section D

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

32. The sum of the areas of two squares is 468 m². If the difference of their perimeters is 24 m, find the sides of the two squares. (5)

OR

Two water taps together fill a tank in $9\frac{3}{8}$ hours. The larger tap takes 10 hours less than the smaller one to fill the tank alone. Find the time each tap takes alone.

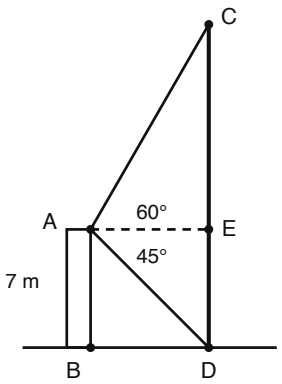
33. The median of the following distribution is 525 and the total frequency is 100. Find x and y. (5)

Class	0–100	100–200	200–300	300–400	400–500
Frequency	2	5	x	12	17
Class	500–600	600–700	700–800	800–900	900–1000
Frequency	20	y	9	7	4

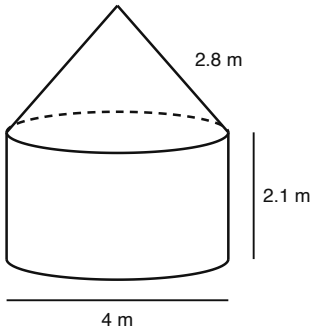
34. A straight highway leads to the foot of a tower. A man at the top of the tower sees a car at an angle of depression of 30°, approaching the foot of the tower at a uniform speed. Six seconds later, the angle of depression of the car is 60°. Find the time the car will take to reach the foot of the tower from this point. (5)

OR

From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Find the height of the tower. (use $\sqrt{3} = 1.73$)



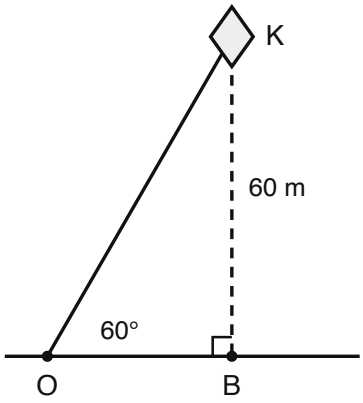
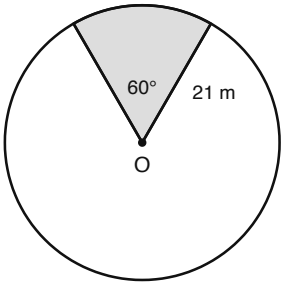
© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

35.	A tent is in the shape of a cylinder surmounted by a conical top. The cylindrical part is 2.1 m high with a diameter of 4 m, and the slant height of the top is 2.8 m. Find the area of canvas used to make the tent, and its cost at ₹500 per m². (use $\pi = \frac{22}{7}$)  	5

Section E

36.	**Case study 1.** Ritu saves ₹50 in the first week of the year and increases her weekly saving by ₹20 every week. (i) How much does she save in the 10th week? *[1]* (ii) In which week does she save ₹350? *[1]* (iii) Find her total savings in the first 20 weeks. *[2]* **OR** (iii) Find her total savings in the first 12 weeks. *[2]*	4

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

37.	**Case study 2.** A kite K is flying 60 m above the ground. Its string is tied to a point O on the ground and makes an angle of 60° with the ground. Assume the string is straight.  (i) Find the length of the string. *[1]* (ii) Find the horizontal distance OB of the point O from the point B directly below the kite. *[1]* (iii) If the kite stays 60 m high but the string makes 45° with the ground, what length of string is needed? *[2]* **OR** (iii) If a 100 m string makes 30° with the ground, how high is the kite? *[2]*	4
38.	**Case study 3.** A circular park of radius 21 m has a flower bed in the shape of a sector with an angle of 60° at the centre. (use $\pi = \frac{22}{7}$)  (i) Find the area of the flower bed. *[1]* (ii) Find the length of the arc of the flower bed. *[1]* (iii) Find the perimeter of the flower bed. *[2]* **OR** (iii) Find the area of the park outside the flower bed. *[2]*	4

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

Answers and Marking Scheme

Marks for each step are shown in brackets. Any correct alternative method gets full credit.

Section A

1. **(B)** 432. *Working:* HCF × LCM = product of the numbers = $18 \times 24 = 432$.

2. **(A)** 1. *Working:* Distinct primes have no common factor other than 1.

3. **(D)** 3. *Working:* Each point where the graph meets the x-axis gives one zero.

4. **(C)** $-\frac{5}{6}$. *Working:* $\frac{\alpha+\beta}{\alpha\beta} = \frac{-5}{6}$.

5. **(D)** parallel. *Working:* $\frac{2}{4} = \frac{-3}{-6} \neq \frac{5}{7}$: no solution, so the lines are parallel.

6. **(B)** 0. *Working:* $D = 48 - 4(3)(4) = 0$.

7. **(A)** 2, 5, 8, 11, …. *Working:* Only 2, 5, 8, 11, … has a constant difference (3).

8. **(C)** 4n + 3. *Working:* $7 + (n-1)4 = 4n + 3$.

9. **(A)** 6. *Working:* $(x-3)^2 + 16 = 25 \Rightarrow x - 3 = \pm 3$, so x = 6 or 0.

10. **(C)** (–7, 0). *Working:* $(x-2)^2 + 25 = (x+2)^2 + 81 \Rightarrow -8x = 56 \Rightarrow x = -7$.

11. **(D)** 9. *Working:* $9(\sec^2 A - \tan^2 A) = 9$.

12. **(B)** $\frac{\sqrt{3}}{2}$. *Working:* θ = 60°, so $\sin\theta = \frac{\sqrt{3}}{2}$.

13. **(C)** 30°. *Working:* $\tan\theta = \frac{30}{30\sqrt{3}} = \frac{1}{\sqrt{3}}$, θ = 30°.

14. **(A)** 70°. *Working:* $\angle B = \angle Q = 60^\circ$, so $\angle C = 180^\circ - 50^\circ - 60^\circ = 70^\circ$.

15. **(B)** 2. *Working:* Exactly two tangents can be drawn from an external point.

16. **(D)** $\frac{77}{8}$ cm². *Working:* $2\pi r = 22 \Rightarrow r = \frac{7}{2}$. Area $= \frac{1}{4} \times \frac{22}{7} \times \frac{49}{4} = \frac{77}{8}$ cm².

17. **(D)** $3\pi r^2$. *Working:* Curved surface $2\pi r^2$ plus flat face πr^2.

18. **(B)** 0.95. *Working:* $1 - 0.05 = 0.95$.

19. **(D)** A is false but R is true. *Working:* A is false: (3, –4) lies in the fourth quadrant. R is true.

20. **(B)** Both A and R are true but R is not the correct explanation of A. *Working:* Both are true, but being even only shows that 2 is a common factor; it does not explain why the HCF is 6.

Section B

21. $72 = 2^3 \times 3^2$, $120 = 2^3 \times 3 \times 5$ (1). HCF $= 2^3 \times 3 = 24$, LCM $= 2^3 \times 3^2 \times 5 = 360$ (1).

22. Sum = 4, product = 4 – 3 = 1 (1). Polynomial: $x^2 - 4x + 1$ (1).

OR From the second, x = 1 + y (½). Then $3 + 3y + 4y = 10$, y = 1 (1), and x = 2 (½).

23. The point dividing it in 1 : 2 is $\left(\frac{-7+4}{3}, \frac{4-4}{3}\right) = (-1, 0)$ (1). The point dividing it in 2 : 1 is $\left(\frac{-14+2}{3}, \frac{8-2}{3}\right) = (-4, 2)$ (1).

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

24. Tangents from an external point are equal: AP = AS, BP = BQ, CR = CQ, DR = DS (1). Adding: AB + CD = (AP + BP) + (DR + CR) = (AS + BQ) + (DS + CQ) = AD + BC (1).

OR AB + CD = AD + BC (1), so 6 + 4 = AD + 7 and AD = 3 cm (1).

25. Expanding, the cross terms $\pm 2\sin\theta\cos\theta$ cancel (1), leaving $2(\sin^2\theta + \cos^2\theta) = 2$ (1).

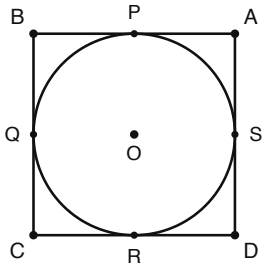
Section C

26. Assume $\sqrt{2} = \frac{a}{b}$, with a, b co-prime integers (½). Then $a^2 = 2b^2$, so 2 divides a^2 and hence a; write a = 2c (1). Then $b^2 = 2c^2$, so 2 divides b (1). So 2 divides both a and b, a contradiction; $\sqrt{2}$ is irrational (½).

27. α + β = 5, αβ = 6 (1). (i) $\alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta = 25 - 12 = 13$ (1). (ii) $\frac{\alpha+\beta}{\alpha\beta} = \frac{5}{6}$ (1).

28. 2p + 3n = 110 and 4p + n = 70 (1). From the second, n = 70 – 4p; then 2p + 210 – 12p = 110, so p = 10 (1). n = 30. A pen costs ₹10 and a notebook ₹30 (1).

29. Let parallelogram ABCD touch the circle at P, Q, R, S on AB, BC, CD, DA (figure, ½). Equal tangents give AB + CD = AD + BC (1). In a parallelogram AB = CD and AD = BC, so 2AB = 2BC (1). Adjacent sides are equal, so ABCD is a rhombus (½).



OR Let $\angle PTQ = \theta$. TP = TQ, so $\angle TPQ = \angle TQP = 90^\circ - \frac{\theta}{2}$ (1). $\angle OPT = 90^\circ$ (radius ⊥ tangent) (1), so $\angle OPQ = 90^\circ - (90^\circ - \frac{\theta}{2}) = \frac{\theta}{2}$, i.e. $\angle PTQ = 2\angle OPQ$ (1).

30. LHS $= \left(\frac{1-\cos\theta}{\sin\theta}\right)^2 = \frac{(1-\cos\theta)^2}{1-\cos^2\theta}$ (1½) $= \frac{(1-\cos\theta)^2}{(1-\cos\theta)(1+\cos\theta)} = \frac{1-\cos\theta}{1+\cos\theta}$ (1½).

OR LHS $= \sin^2 A + 2 + \operatorname{cosec}^2 A + \cos^2 A + 2 + \sec^2 A$ (1) $= 5 + (1 + \cot^2 A) + (1 + \tan^2 A)$ (1) $= 7 + \tan^2 A + \cot^2 A$ (1).

31. Modal class 20–30; l = 20, $f_1 = 12$, $f_0 = 8$, $f_2 = 7$, h = 10 (1). Mode $= 20 + \frac{12-8}{24-8-7} \times 10$ (1) $= 20 + \frac{40}{9} \approx 24.44$ (1).

Section D

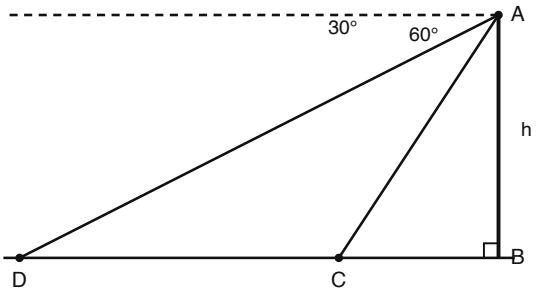
32. Let the sides be x and y with x > y: 4x – 4y = 24, so x = y + 6 (1). $(y+6)^2 + y^2 = 468$ (1) $\Rightarrow y^2 + 6y - 216 = 0$ (1) $\Rightarrow (y+18)(y-12) = 0$ (1). y = 12, so the sides are 12 m and 18 m (1).

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.

OR Let the smaller tap take x hours; the larger takes x – 10 (½). $\frac{1}{x}+\frac{1}{x-10}=\frac{8}{75}$ (1). $75(2x-10)=8x(x-10)\Rightarrow 4x^2-115x+375=0$ (1½). $x=\frac{115\pm 85}{8}$ = 25 or 3.75 (1). x = 3.75 makes x – 10 negative, so the taps take 25 hours and 15 hours (1).

33. Total: 76 + x + y = 100, so x + y = 24 (1). The median 525 lies in 500–600: l = 500, f = 20, h = 100, cf = 36 + x (1). $525=500+\frac{50-(36+x)}{20}\times 100$ (1) $\Rightarrow 25=5(14-x)\Rightarrow$ x = 9 (1). y = 15 (1).

34. Figure (1). Let the height be h. First position: distance $h\cot 30^\circ=h\sqrt{3}$ (1). Second position: $h\cot 60^\circ=\frac{h}{\sqrt{3}}$ (1). Distance covered in 6 s $=h\sqrt{3}-\frac{h}{\sqrt{3}}=\frac{2h}{\sqrt{3}}$ (1). The remaining $\frac{h}{\sqrt{3}}$ is half of that, so it takes 3 more seconds (1).



OR With the angle of depression of D equal to 45°, BD = AB = 7 m, so AE = 7 m (1½). $CE=AE\tan 60^\circ=7\sqrt{3}$ m (1½). Height CD = CE + ED $=7+7\sqrt{3}=7(1+\sqrt{3})=7\times 2.73=19.11$ m (2).

35. r = 2 m (½). CSA of cylinder $=2\pi rh=2\times\frac{22}{7}\times 2\times 2.1=26.4$ m² (1½). CSA of cone $=\pi rl=\frac{22}{7}\times 2\times 2.8=17.6$ m² (1½). Canvas = 44 m² (1); cost = ₹22 000 (½).

Section E

36. (i) $50+9\times 20=₹230$.
(ii) $50+20(n-1)=350\Rightarrow n=16$: the 16th week.
(iii) $S_{20}=10(2\times 50+19\times 20)=10\times 480=₹4800$. **OR** $S_{12}=6(100+11\times 20)=6\times 320=₹1920$.

37. (i) $OK=\frac{60}{\sin 60^\circ}=40\sqrt{3}\approx 69.28$ m.
(ii) $OB=\frac{60}{\tan 60^\circ}=20\sqrt{3}\approx 34.64$ m.
(iii) $\frac{60}{\sin 45^\circ}=60\sqrt{2}\approx 84.85$ m. **OR** $100\sin 30^\circ=50$ m.

38. (i) $\frac{60}{360}\times\frac{22}{7}\times 21^2=231$ m².
(ii) $\frac{60}{360}\times 2\times\frac{22}{7}\times 21=22$ m.
(iii) Arc + two radii = 22 + 42 = 64 m. **OR** $\frac{22}{7}\times 441-231=1386-231=1155$ m².

© 2026 JEEInfo (www.jeeinfo.in). Free for personal study only. Do not copy, sell or republish without written permission. Not an official CBSE paper.