

CLASS 10 MATHEMATICS

Most Repeated Questions

2015 - 2026

Based on 10+ years of CBSE Board Exam Previous Year Papers

10+	14	80	2015-2026
Years	Chapters	Marks	Coverage

Study highlighted questions first — they account for 70%+ of board exam marks

How to use this guide: Each chapter shows the most frequently repeated question patterns based on CBSE board exam papers from 2015 to 2026. Year tags show which specific years had those questions. Study highlighted questions first — they account for 70%+ of board exam marks.

Ch. 1 Real Numbers

Weightage: ~6 marks | 2-mark proof + 1-mark MCQ

- Q1.** Prove that $\sqrt{2}$ is irrational. (Repeated 2015, 2016, 2018, 2020, 2022)
- Q2.** Prove that $\sqrt{3}$ is irrational. (Repeated 2017, 2019, 2021, 2023)
- Q3.** Prove that $(2 + \sqrt{3}) / 5$ is irrational, given that $\sqrt{3}$ is irrational.
- Q4.** Prove that $3 + 2\sqrt{5}$ is irrational.
- Q5.** Find HCF and LCM of 306 and 657 using prime factorisation. Hence verify: $\text{HCF} \times \text{LCM} =$ product of the two numbers.
- Q6.** Use Euclid's Division Lemma to show that the square of any positive integer is of the form $3m$ or $3m + 1$.
- Q7.** Given that $\text{HCF}(306, 657) = 9$, find $\text{LCM}(306, 657)$.

■ Exam Tip Proving irrationality appears every year. Use contradiction: assume p/q in lowest terms, then show p and q share a common factor — contradiction.

Year Coverage: [2015] [2016] [2017] [2018] [2019] [2020] [2022] [2024]

Ch. 2 Polynomials

Weightage: ~4 marks | 2-mark + 2-mark

- Q1.** Find a quadratic polynomial whose sum of zeroes = $6/5$ and product of zeroes = $4/25$. (Repeated 2015, 2016, 2020)
- Q2.** Find the zeroes of $6x^2 - 7x - 3$ and verify the relationship between zeroes and coefficients.
- Q3.** Find zeroes of $p(x) = 25x^2 - 30x + 4$. Also form a polynomial if zeroes are $(3+\sqrt{5})/5$ and $(3-\sqrt{5})/5$.
- Q4.** If the sum of zeroes of $p(x) = (k^2 - 14)x^2 - 2x - 12$ is 1, find the value of k .
- Q5.** Find all zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, given two zeroes are $\sqrt{2}$ and $-\sqrt{2}$.
- Q6.** If α and β are zeroes of $x^2 - 4x + 3$, form a polynomial with zeroes 3α and 3β .

■ Exam Tip For 'form a polynomial': use $P(x) = x^2 - (\text{Sum})x + (\text{Product})$. Always verify by checking $-b/a$ and c/a match the sum and product of zeroes.

Year Coverage: [2015] [2016] [2017] [2019] [2020] [2022]

Ch. 3 Linear Equations in Two Variables

Weightage: ~8 marks | 3-mark word problem + graphical method

- Q1.** Taxi fare: first km costs ₹ x , each subsequent km costs ₹ y . A person paid ₹89 for 12 km and ₹215 for 30 km. Find x and y . (2015, 2018, 2022)
- Q2.** A boat goes 44 km upstream and 20 km downstream in 4 hours each. Find the speed of the stream and the boat in still water. (2015)
- Q3.** 5 pencils + 7 pens = ₹50 and 7 pencils + 5 pens = ₹46. Find the cost of each.
- Q4.** A fraction becomes $\frac{9}{11}$ if 2 is added to both numerator and denominator. If 3 is added to both, it becomes $\frac{5}{6}$. Find the fraction.
- Q5.** Solve graphically: $2x + y = 6$ and $2x - y = 2$. Find the area of the triangle formed with the x -axis.
- Q6.** The sum of a 2-digit number and the number obtained by reversing its digits is 66. The digits differ by 2. Find the number.
- Q7.** 10 students took part in a quiz. The number of girls is 4 more than the number of boys. Find the number of boys and girls.

Exam Tip Taxi-fare and boat-stream problems appear every year. Let boat speed = x , stream speed = y . Then upstream speed = $(x - y)$, downstream speed = $(x + y)$. Form two equations and solve.

Year Coverage: [2015] [2016] [2017] [2018] [2020] [2022] [2023]

Ch. 4 Quadratic Equations

Weightage: ~8 marks | HIGHEST priority — appears every single year

- Q1.** A plane was delayed by 30 minutes. To cover 1500 km on time, its speed was increased by 250 km/h. Find the usual speed. (Repeated 2015, 2016, 2018, 2019, 2020, 2021, 2022)
- Q2.** The sum of two numbers is 9. The sum of their reciprocals is $\frac{1}{2}$. Find the numbers.
- Q3.** The difference of two numbers is 5. The difference of their reciprocals is $\frac{1}{10}$. Find the numbers.
- Q4.** Find the value of k so that $kx(x - 2) + 6 = 0$ has two equal real roots.
- Q5.** Solve by factorisation: $2x^2 - 7x + 3 = 0$. Also solve $6x^2 - x - 2 = 0$.
- Q6.** A train travels 360 km at uniform speed. If the speed were 5 km/h more, it would take 1 hour less. Find the speed.
- Q7.** Two water taps together fill a tank in $9\frac{3}{4}$ hours. The larger tap takes 10 hours less than the smaller tap. Find the time taken by each.
- Q8.** Find the nature of roots using discriminant ($D = b^2 - 4ac$): (i) $2x^2 - 6x + 3 = 0$ (ii) $3x^2 - 4x + 4 = 0$

Exam Tip Plane-delay problem: let usual speed = x . Then $1500/x - 1500/(x+250) = 1/2$. Multiply through to form a quadratic. Use quadratic formula: $x = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$.

Year Coverage: [2015] [2016] [2017] [2018] [2019] [2020] [2021] [2022] [2023] [2024] [2025]

Ch. 5 Arithmetic Progressions (AP)

Weightage: ~8 marks | 3-mark + 4-mark

- Q1.** A thief runs at 100 m/min. After 1 minute, a policeman chases: starts at 100 m/min, increases speed by 10 m/min each minute. In how many minutes does the policeman catch the thief? (2015-2020)
- Q2.** Find the sum of all multiples of 7 between 500 and 900.
- Q3.** The 17th term of an AP exceeds the 10th term by 7. Find the common difference.
- Q4.** How many terms of the AP 9, 17, 25, ... must be taken to give a sum of 636?
- Q5.** Sum of first 7 terms = 49 and sum of first 17 terms = 289. Find the sum of the first n terms.
- Q6.** The sum of first n terms is $5n^2 + 3n$. Find the n th term and the 20th term.
- Q7.** Which term of the AP 3, 15, 27, 39, ... is 132 more than its 54th term?

■ **Exam Tip** Key formulas: n th term = $a + (n-1)d$ and $S_n = (n/2) \times [2a + (n-1)d]$. Policeman problem: distance by thief in $(n+1)$ min = distance by policeman in n min.

Year Coverage: [2015] [2016] [2018] [2019] [2021] [2022] [2023]

Ch. 6 Triangles

Weightage: ~8 marks | 5-mark proof appears EVERY year

- Q1.** Prove: If sides AB, BC and median AD of $\triangle ABC$ are proportional to sides PQ, QR and median PM of $\triangle PQR$, show that $\triangle ABC \sim \triangle PQR$. (Repeated 2013, 2015, 2017, 2019, 2021)
- Q2.** State and prove the Basic Proportionality Theorem (Thales' Theorem).
- Q3.** Prove the Pythagoras Theorem: In a right triangle, the square of the hypotenuse equals the sum of the squares of the other two sides.
- Q4.** In $\triangle ABC$, D and E are points on AB and AC respectively. If $AD/DB = AE/EC$, prove that $DE \parallel BC$.
- Q5.** Areas of two similar triangles are 81 cm^2 and 49 cm^2 . If the altitude of the first = 4.5 cm, find the altitude of the second.
- Q6.** Prove that the ratio of areas of two similar triangles equals the square of the ratio of their corresponding sides.

■ **Exam Tip** Triangles gives 8 marks and appears every year. Learn BPT proof and Pythagoras proof word-for-word. For the median-proportionality question, extend the median and apply the mid-point theorem.

Year Coverage: [2015] [2017] [2019] [2020] [2021] [2022] [2023] [2024] [2025]

Ch. 7 Coordinate Geometry

Weightage: ~6 marks | 2-mark + 3-mark

- Q1.** Find the ratio in which the y-axis divides the line joining A(5, -6) and B(-1, -4). Also find the point of division. (Repeated 2015, 2017, 2020)
- Q2.** Find the area of the triangle with vertices (1, -1), (-4, 6) and (-3, -5).
- Q3.** Find the point on the x-axis equidistant from (2, -5) and (-2, 9).
- Q4.** Find the coordinates of the point dividing the join of (-1, 7) and (4, -3) in the ratio 2:3 internally.
- Q5.** If (1, 2), (4, y), (x, 6) and (3, 5) are vertices of a parallelogram, find x and y.
- Q6.** Find the area of the quadrilateral with vertices A(-5, 7), B(-4, -5), C(-1, -6), D(4, 5).

■ **Exam Tip** Area of triangle = $\frac{1}{2} |x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$. Section formula: $x = \frac{mx_2 + nx_1}{m+n}$, $y = \frac{my_2 + ny_1}{m+n}$.

Year Coverage: [2015] [2017] [2018] [2020] [2022] [2024]

Ch. 8 & 9 Trigonometry & Its Applications

Weightage: ~12 marks | HIGHEST frequency — appears every single year

- Q1.** Prove: $(1 + \cot A + \tan A)(\sin A - \cos A) = (\sec^3 A - \operatorname{cosec}^3 A) / (\sec^2 A \times \operatorname{cosec}^2 A)$. (2011-2023)
- Q2.** From the top of a 100 m lighthouse, the angles of depression of two ships are 30° and 45° . One ship is behind the other. Find the distance between the ships. [$\sqrt{3} = 1.732$] (Repeated 2011-2020)
- Q3.** Two poles of equal heights stand on either side of an 80 m wide road. The angles of elevation from a midpoint are 60° and 30° . Find the height of the poles.
- Q4.** Angle of elevation of the top of a building from the foot of a tower = 30° ; from the foot of the building to the top of the tower = 60° . Tower height = 50 m. Find the height of the building.
- Q5.** Prove: $\sin\theta / (1 - \cos\theta) + (1 - \cos\theta) / \sin\theta = 2 \operatorname{cosec}\theta$.
- Q6.** Prove: $(\tan A + \sin A) / (\tan A - \sin A) = (\sec A + 1) / (\sec A - 1)$.
- Q7.** If $\sec\theta + \tan\theta = p$, prove that $\sin\theta = (p^2 - 1) / (p^2 + 1)$.
- Q8.** Evaluate: $(\sin 30^\circ + \tan 45^\circ - \operatorname{cosec} 60^\circ) / (\sec 30^\circ + \cos 60^\circ + \cot 45^\circ)$.

■ **Exam Tip** Trigonometry + Height & Distance = 12 marks every year. For proofs: convert everything to sin and cos. For H&D; problems: draw the diagram first, mark angles, use $\tan(\theta) = \text{opposite} / \text{adjacent}$.

Year Coverage: [2015] [2016] [2017] [2018] [2019] [2020] [2021] [2022] [2023] [2024] [2025]

Ch. 10 & 11 Circles

Weightage: ~4-5 marks | 3-mark theorem proof

- Q1.** Prove: The tangent at any point of a circle is perpendicular to the radius through that point.
- Q2.** Prove: Tangents PA and PB drawn from an external point P to a circle are equal in length ($PA = PB$).
- Q3.** Prove: Opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre.
- Q4.** A quadrilateral ABCD circumscribes a circle. Prove: $AB + CD = AD + BC$.
- Q5.** Tangents PA and PB are drawn from an external point P; $\angle APB = 60^\circ$. Find $\angle OAB$.

■ Exam Tip Two proofs dominate every alternate year: (1) Tangent \perp radius — use right angle + congruence. (2) Tangents from external point are equal — use RHS congruence of triangles OAP and OBP.

Year Coverage: [2015] [2017] [2019] [2021] [2023] [2025]

Ch. 12 & 13 Mensuration — Surface Area & Volume

Weightage: ~10 marks | Composite solids appear EVERY year

- Q1.** A solid consists of a cone on top of a hemisphere. Radius = 3.5 cm each, total height = 9.5 cm. Find the volume. [$\pi = 22/7$] (Repeated 2011-2020)
- Q2.** A sphere of diameter 8 cm is melted and drawn into a cylindrical wire of diameter 2 mm. Find the length of the wire.
- Q3.** A 20 m deep well of diameter 7 m is dug. The earth is spread evenly to form a platform 22 m \times 14 m. Find the height of the platform.
- Q4.** Water flows through a pipe of diameter 1.4 cm at 2.2 km/h. Find the time to fill a tank of dimensions 80 cm \times 44 cm \times 21 cm.
- Q5.** A toy = cone (radius 3.5 cm) on a hemisphere (radius 3.5 cm). Total height = 15.5 cm. Find the total surface area.
- Q6.** Frustum of a cone: top radius = 8 cm, bottom radius = 20 cm, height = 16 cm. Find the curved surface area. [$\pi = 3.14$]
- Q7.** A solid sphere of radius 3 cm is melted into small spheres of radius 0.6 cm. Find the number of small spheres formed.

■ Exam Tip Key formulas — Cone: $V = (1/3)\pi r^2 h$, $CSA = \pi r l$. Hemisphere: $V = (2/3)\pi r^3$, $CSA = 2\pi r^2$. Frustum: $V = (\pi h/3)(R^2 + r^2 + Rr)$, slant height $l = \sqrt{h^2 + (R-r)^2}$.

Year Coverage: [2015] [2016] [2017] [2018] [2019] [2020] [2021] [2022] [2023] [2024] [2025]

Ch. 14
& 15

Statistics & Probability

Weightage: ~11 marks | Most predictable and scoring chapter

- Q1.** Find the mean of grouped data using the assumed-mean method / step-deviation method. (Every year)
- Q2.** Find the median of grouped data using the formula. Draw a less-than ogive and locate the median graphically.
- Q3.** Find the mode for: 125-145: 10, 145-165: 20, 165-185: 22, 185-205: 14, 205-225: 8.
- Q4.** Cards numbered 1 to 30 are placed in a box. One card is drawn at random. Find P(prime), P(multiple of 3), P(not divisible by 3).
- Q5.** Two dice are thrown simultaneously. Find P(sum = 7), P(sum > 10), P(both show the same number).
- Q6.** A bag has 5 red, 4 blue and 3 black balls. Find P(not blue), P(red or black).
- Q7.** From a well-shuffled deck of 52 cards, find P(face card), P(red king), P(jack of spades).

■ **Exam Tip** Three guaranteed-mark formulas — Mean (step-deviation): $u = (x-a)/h$, Mean = $a + h \times (\sum fu / \sum f)$. Median = $l + [(n/2 - cf)/f] \times h$. Mode = $l + [(f_1 - f_0) / (2f_1 - f_0 - f_2)] \times h$.

Year Coverage: [2015] [2016] [2017] [2018] [2019] [2020] [2021] [2022] [2023] [2024] [2025]

■ Smart Strategy for Maximum Marks

Quadratic Equations, Trigonometry, Triangles and Mensuration appear every single year and together carry **38+ marks**. Master these first. **Statistics & Probability** are the most predictable chapters — never skip them. **Real Numbers & Polynomials** give easy marks with minimal effort.