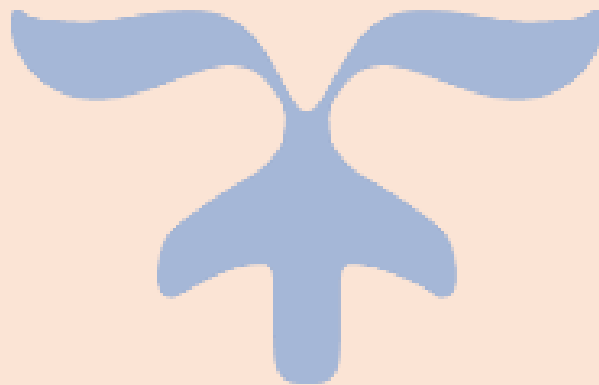




THE ULTIMATE CLASS 10 MATHEMATICS MCQ BANK

FOR THE SESSION 2026-27



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CLASS 10 MATHEMATICS MCQ BANK

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Chapter 1: Real Numbers

Easy Type Questions (1 to 10)

- The HCF of 26 and 91 is:
(a) 13 (b) 26 (c) 7 (d) 1
- The prime factorization of 140 is:
(a) $2^2 \times 5 \times 7$ (b) $2 \times 5^2 \times 7$ (c) $2^2 \times 3 \times 5$ (d) 2×7^2
- The LCM of 12, 15, and 21 is:
(a) 420 (b) 120 (c) 210 (d) 315
- Which of the following is an irrational number?
(a) $\sqrt{16}$ (b) $\sqrt{12} / \sqrt{3}$ (c) $\sqrt{10}$ (d) $\sqrt{9}$
- The HCF of two distinct prime numbers p and q is:
(a) p (b) q (c) pq (d) 1
- If $\text{LCM}(26, 169) = 338$, then $\text{HCF}(26, 169)$ is:
(a) 13 (b) 26 (c) 1 (d) 338
- The product of a non-zero rational and an irrational number is:
(a) always irrational (b) always rational (c) rational or irrational (d) 1
- The sum of the exponents of the prime factors in the prime factorization of 196 is:
(a) 3 (b) 4 (c) 5 (d) 2
- The number π (pi) is:
(a) an integer (b) a rational number (c) an irrational number (d) a whole number
- The number $5 - \sqrt{3}$ is:
(a) an integer (b) a rational number (c) an irrational number (d) a whole number

Moderate Type Questions (11 to 20)

- If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, where x and y are prime numbers, then $\text{HCF}(a, b)$ is:
(a) xy (b) xy^2 (c) x^3y^3 (d) x^2y^2
- For the same integers in question 11, the $\text{LCM}(a, b)$ is:
(a) xy (b) xy^2 (c) x^3y^3 (d) x^2y^2
- The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is:
(a) 10 (b) 100 (c) 504 (d) 2520
- Three bells toll at intervals of 12, 15, and 18 minutes. If they start tolling together, after what time will they next toll together?
(a) 90 min (b) 120 min (c) 180 min (d) 360 min
- The HCF of the smallest prime number and the smallest composite number is:
(a) 1 (b) 2 (c) 3 (d) 4

16. If $\text{HCF}(a, 8) = 4$ and $\text{LCM}(a, 8) = 24$, then the value of 'a' is:
 (a) 12 (b) 14 (c) 8 (d) 10
17. The LCM of two numbers is 1200. Which of the following cannot be their HCF?
 (a) 600 (b) 500 (c) 400 (d) 200
18. Two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$, where a and b are prime numbers. Their LCM is:
 (a) ab (b) a^2b^2 (c) a^3b^2 (d) a^3b^3
19. The largest number which divides 70 and 125, leaving remainders 5 and 8 respectively, is:
 (a) 13 (b) 65 (c) 875 (d) 1750
20. In a prime factorization tree, if x branches to 2 and y, and y branches to 3 and 7, then the values of x and y are:
 (a) $x=21, y=42$ (b) $x=42, y=21$ (c) $x=10, y=5$ (d) $x=42, y=7$

HOTS Type Questions (21 to 30)

21. The HCF of $(2^3 \times 3^2 \times 5)$, $(2^2 \times 3^3 \times 5^2)$ and $(2^4 \times 3 \times 5^3 \times 7)$ is:
 (a) 30 (b) 48 (c) 60 (d) 105
22. If two positive integers m and n are expressible in the form $m = pq^3$ and $n = p^3q^2$, where p and q are prime numbers, then $\text{HCF}(m,n) \times \text{LCM}(m,n)$ is:
 (a) p^2q^5 (b) p^4q^5 (c) p^3q^4 (d) p^4q^4
23. The HCF of 396 and 1080 is 36. Their LCM is:
 (a) 11880 (b) 11808 (c) 11088 (d) 18180
24. The ratio of the LCM and HCF of the least composite and the least prime numbers is:
 (a) 1:2 (b) 2:1 (c) 1:1 (d) 1:3
25. The number $3^{13} - 3^{10}$ is divisible by:
 (a) 2 and 3 only (b) 3 and 10 only (c) 2, 3 and 13 (d) 2, 3 and 11
26. If 'a' and 'b' are two coprime numbers, then a^3 and b^3 are:
 (a) Coprime (b) Not coprime (c) Always even (d) Always odd
27. What is the greatest possible speed at which a man can walk 52 km and 91 km in an exact number of hours?
 (a) 17 km/h (b) 7 km/h (c) 13 km/h (d) 26 km/h
28. Let a and b be two positive integers such that $a = p^3q^4$ and $b = p^2q^3$ (p and q are primes). If $\text{HCF}(a,b) = p^m q^n$ and $\text{LCM}(a,b) = p^r q^s$, then $(m+n)(r+s)$ is:
 (a) 15 (b) 30 (c) 35 (d) 72
29. If n is any natural number, then $6^n - 5^n$ always ends with the digit:
 (a) 1 (b) 3 (c) 5 (d) 7
30. If the HCF of 65 and 117 is expressible in the form $65m - 117$, then the value of m is:
 (a) 4 (b) 2 (c) 1 (d) 3

CBSE Board Exam PYQs (31 to 50)

31. (CBSE 2024) The prime factorization of 2024 is:
(a) $2^2 \times 11 \times 23$ (b) $2^3 \times 11 \times 23$ (c) $2 \times 11^2 \times 23$ (d) $2^3 \times 11 \times 13$
32. (CBSE 2024) If the LCM of two numbers is 3600 and their HCF is 12, which of the following cannot be one of the numbers?
(a) 300 (b) 400 (c) 144 (d) 150
33. (CBSE 2023) If $a = 2^3 \times 3$, $b = 2 \times 3 \times 5$, $c = 3^n \times 5$ and $\text{LCM}(a, b, c) = 2^3 \times 3^2 \times 5$, then n is:
(a) 1 (b) 2 (c) 3 (d) 4
34. (CBSE 2023) The LCM of two prime numbers p and q ($p > q$) is 221. Find the value of $3p - q$.
(a) 4 (b) 28 (c) 38 (d) 48
35. (CBSE 2023) The HCF of 144 and 198 is:
(a) 9 (b) 18 (c) 6 (d) 12
36. (CBSE 2022) The sum of exponents of prime factors in the prime factorization of 250 is:
(a) 2 (b) 3 (c) 4 (d) 5
37. (CBSE 2024) Which of the following is an irrational number?
(a) $\sqrt[4]{9}$ (b) $4/5$ (c) $\sqrt{7}$ (d) $\sqrt{81}$
38. (CBSE 2021) The HCF and LCM of 12, 21, 15 respectively are:
(a) 3, 140 (b) 12, 420 (c) 3, 420 (d) 420, 3
39. (CBSE 2021) If two positive integers A and B are written as $A = x y^3$ and $B = x^3 y^2 z$, then $\text{LCM}(A, B)$ is:
(a) $x y^2$ (b) $x^3 y^3 z$ (c) $x^3 y^2$ (d) $x y z$
40. (CBSE 2020) If the HCF of 65 and 117 is expressible in the form $65m - 117$, then the value of m is:
(a) 4 (b) 2 (c) 1 (d) 3
41. (CBSE 2020) The largest number which divides 70 and 125, leaving remainders 5 and 8 respectively, is:
(a) 13 (b) 65 (c) 875 (d) 1750
42. (CBSE 2020) The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is:
(a) 10 (b) 100 (c) 504 (d) 2520
43. (CBSE 2024) The total number of factors of a prime number is:
(a) 1 (b) 0 (c) 2 (d) 3
44. (CBSE 2023) The HCF of two numbers is 27 and their LCM is 162. If one of the numbers is 54, then the other number is:
(a) 36 (b) 35 (c) 9 (d) 81
45. (CBSE 2021) The LCM of the smallest two-digit composite number and the smallest composite number is:
(a) 12 (b) 4 (c) 20 (d) 44
46. (CBSE 2023) If $\text{HCF}(336, 54) = 6$, then $\text{LCM}(336, 54)$ is:
(a) 2024 (b) 3024 (c) 1012 (d) 1512

47. (CBSE 2024) Three alarm clocks ring their alarms at regular intervals of 20, 25 and 30 minutes respectively. If they first beep together at 12 noon, at what time will they beep again for the first time?
- (a) 4:00 pm (b) 4:30 pm (c) 5:00 pm (d) 5:30 pm
48. (CBSE 2020) The ratio of LCM and HCF of the least composite and the least prime numbers is:
- (a) 1:2 (b) 2:1 (c) 1:1 (d) 1:3
49. (CBSE 2022) The product of a non-zero rational and an irrational number is:
- (a) always irrational (b) always rational (c) rational or irrational (d) 1
50. (CBSE 2021) Two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$. Their LCM is:
- (a) ab (b) a^2b^2 (c) a^3b^2 (d) a^3b^3

CHAPTER 2: POLYNOMIALS

Easy Type Questions (1 to 10)

51. A quadratic polynomial can have at most how many zeroes?
- (a) 0 (b) 1 (c) 2 (d) 3
52. The zeroes of the quadratic polynomial $x^2 + 7x + 10$ are:
- (a) 2, 5 (b) -2, -5 (c) -2, 5 (d) 2, -5
53. If α, β are the zeroes of the polynomial $x^2 - 5x + 6$, then $\alpha + \beta$ is:
- (a) -5 (b) 5 (c) 6 (d) -6
54. The product of zeroes of the polynomial $4x^2 - 3x - 7$ is:
- (a) $3/4$ (b) $-3/4$ (c) $7/4$ (d) $-7/4$
55. A quadratic polynomial whose zeroes are -3 and 4 is:
- (a) $x^2 - x + 12$ (b) $x^2 + x + 12$ (c) $x^2 - x - 12$ (d) $x^2 + x - 12$
56. If 1 is a zero of the polynomial $p(x) = ax^2 - 3(a - 1)x - 1$, then the value of a is:
- (a) 1 (b) -1 (c) 2 (d) -2
57. The zeroes of the polynomial $x^2 - 3$ are:
- (a) 3, -3 (b) $\sqrt{3}, -\sqrt{3}$ (c) $\sqrt{3}, \sqrt{3}$ (d) 3, 3
58. The graph of a quadratic polynomial is a:
- (a) Straight line (b) Circle (c) Parabola (d) Ellipse
59. A quadratic polynomial whose sum and product of zeroes are 2 and -15 respectively is:
- (a) $x^2 - 2x + 15$ (b) $x^2 - 2x - 15$ (c) $x^2 + 2x - 15$ (d) $x^2 + 2x + 15$
60. If one zero of the polynomial $f(x) = kx^2 + 4x + 4$ is -2, the value of k is:
- (a) 1 (b) -1 (c) 2 (d) -2

Moderate Type Questions (11 to 20)

61. If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3, then:

- (a) $a = -7, b = -1$ (b) $a = 5, b = -1$ (c) $a = 2, b = -6$ (d) $a = 0, b = -6$

62. If α, β are the zeroes of the polynomial $f(x) = x^2 - p(x + 1) - c$, then $(\alpha + 1)(\beta + 1)$ is equal to:
 (a) $c - 1$ (b) $1 - c$ (c) c (d) $1 + c$
63. If one zero of the polynomial $3x^2 - 8x + (2k + 1)$ is seven times the other, then the value of k is:
 (a) $2/3$ (b) $-2/3$ (c) $1/3$ (d) $-1/3$
64. If the sum of the zeroes of the polynomial $p(x) = (k^2 - 14)x^2 - 2x - 12$ is 1, then k is:
 (a) ± 4 (b) ± 3 (c) ± 2 (d) ± 1
65. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, ($c \neq 0$) are equal, then:
 (a) c and a have opposite signs (b) c and b have opposite signs
 (c) c and a have the same sign (d) c and b have the same sign
66. If one of the zeroes of a quadratic polynomial of the form $x^2 + ax + b$ is the negative of the other, then it:
 (a) has no linear term and the constant term is negative
 (b) has no linear term and the constant term is positive
 (c) can have a linear term but the constant term is negative
 (d) can have a linear term but the constant term is positive
67. Find the value of k if the sum of squares of the zeroes of the polynomial $x^2 - 8x + k$ is 40.
 (a) 12 (b) -12 (c) 10 (d) 14
68. The number of polynomials having zeroes as -2 and 5 is:
 (a) 1 (b) 2 (c) 3 (d) more than 3
69. If α and β are the zeroes of the polynomial $2x^2 - 4x + 5$, then the value of $\alpha^2 + \beta^2$ is:
 (a) -1 (b) 1 (c) -5 (d) 5
70. If one zero of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is -3, then the value of k is:
 (a) $4/3$ (b) $-4/3$ (c) $2/3$ (d) $-2/3$

HOTS Type Questions (21 to 30)

71. If α and β are the zeroes of the polynomial $f(x) = x^2 - 6x + a$ and $3\alpha + 2\beta = 20$, then the value of a is:
 (a) 16 (b) -16 (c) 12 (d) 8
72. If α, β are zeroes of the polynomial $x^2 - px + q$, then the value of $1/\alpha^2 + 1/\beta^2$ is:
 (a) $(p^2 - 2q)/q^2$ (b) $(p^2 - 2q)/p^2$ (c) $(q^2 - 2p)/q^2$ (d) $(q^2 - 2p)/p^2$
73. If the zeroes of the polynomial $x^2 - px + q$ are in the ratio 2:3, then:
 (a) $5p^2 = 6q$ (b) $6p^2 = 25q$ (c) $25p^2 = 6q$ (d) $6p^2 = 5q$
74. If α and β are zeroes of the polynomial $f(x) = 2x^2 + 5x + k$ satisfying the relation $\alpha^2 + \beta^2 + \alpha\beta = 21/4$, then find k .
 (a) 2 (b) -2 (c) 3 (d) -3
75. If α, β are zeroes of the polynomial $f(x) = x^2 - 4x + 3$, then the exact value of $\alpha^4\beta^2 + \alpha^2\beta^4$ is:
 (a) 90 (b) 180 (c) -90 (d) 162

76. If the square of the difference of the zeroes of the quadratic polynomial $x^2 + px + 45$ is equal to 144, the value of p is:
- (a) ± 18 (b) ± 16 (c) ± 15 (d) ± 12
77. If α and β are the zeroes of the quadratic polynomial $4x^2 - 5x - 1$, find the value of $\alpha^2\beta + \alpha\beta^2$.
- (a) $-5/16$ (b) $5/16$ (c) $-5/4$ (d) $5/4$
78. A quadratic polynomial whose zeroes are the reciprocals of the zeroes of the polynomial $ax^2 + bx + c$ is:
- (a) $cx^2 + bx + a$ (b) $ax^2 - bx + c$ (c) $cx^2 - bx + a$ (d) $bx^2 + cx + a$
79. If the zeroes of polynomial $ax^2 + bx + b$ are in ratio $m:n$, then $\sqrt[3]{(m/n)} + \sqrt[3]{(n/m)} + \sqrt[3]{(b/a)}$ is:
- (a) 0 (b) 1 (c) -1 (d) b/a
80. The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are:
- (a) both positive (b) both negative
(c) one positive and one negative (d) both equal

CBSE Board Exam PYQs (31 to 50)

81. (CBSE 2024) What should be added to the polynomial $x^2 - 5x + 4$, so that 3 is the zero of the resulting polynomial?
- (a) 1 (b) 2 (c) 4 (d) 5
82. (CBSE 2024) If α and β are the zeroes of the polynomial $p(x) = 4x^2 - 3x - 7$, then $1/\alpha + 1/\beta$ is:
- (a) $3/7$ (b) $-3/7$ (c) $7/3$ (d) $-7/3$
83. (CBSE 2023) If one zero of the polynomial $p(x) = 6x^2 + 37x - (k - 2)$ is the reciprocal of the other, then find the value of k .
- (a) -4 (b) -6 (c) 6 (d) 4
84. (CBSE 2023) The graph of $y = p(x)$ for a polynomial $p(x)$ intersects the x -axis at exactly two distinct points. The number of zeroes of $p(x)$ is:
- (a) 1 (b) 2 (c) 3 (d) 0
85. (CBSE 2023) If α, β are the zeroes of a polynomial $p(x) = x^2 + x - 1$, then the value of $\alpha + \beta$ is:
- (a) 1 (b) -1 (c) 0 (d) -2
86. (CBSE 2022) For what value of k , is (-4) a zero of the polynomial $x^2 - x - (2k + 2)$?
- (a) 7 (b) 8 (c) 9 (d) 10
87. (CBSE 2022) The quadratic polynomial, sum and product of whose zeroes are $-1/2$ and -3 respectively is:
- (a) $2x^2 + x - 6$ (b) $2x^2 - x + 6$ (c) $2x^2 + x + 6$ (d) $2x^2 - x - 6$
88. (CBSE 2021) Write the polynomial, the product and sum of whose zeroes are $-9/2$ and $-3/2$ respectively.
- (a) $2x^2 - 3x - 9$ (b) $2x^2 + 3x - 9$ (c) $2x^2 + 3x + 9$ (d) $2x^2 - 3x + 9$
89. (CBSE 2021) If one zero of the quadratic polynomial $3x^2 + px - 8$ is 2, find the value of p .
- (a) 2 (b) -2 (c) 4 (d) -4
90. (CBSE 2020) If α and β are the zeroes of the polynomial $2y^2 + 7y + 5$, find the value of $\alpha + \beta + \alpha\beta$.
- (a) -1 (b) 0 (c) 1 (d) 2

91. (CBSE 2020) Find the value of k if the zeroes of the quadratic polynomial $x^2 + (k+1)x + k$ are equal.
- (a) 1 (b) -1 (c) 2 (d) -2
92. (CBSE 2024) If one zero of the polynomial $x^2 - 4x + 1$ is $2 + \sqrt{3}$, write the other zero.
- (a) $2 - \sqrt{3}$ (b) $-2 + \sqrt{3}$ (c) $-2 - \sqrt{3}$ (d) $\sqrt{3} - 2$
93. (CBSE 2023) A quadratic polynomial whose zeroes are $5 - 3\sqrt{2}$ and $5 + 3\sqrt{2}$ is:
- (a) $x^2 - 10x + 7$ (b) $x^2 + 10x + 7$ (c) $x^2 - 10x - 7$ (d) $x^2 + 10x - 7$
94. (CBSE 2022) If α and β are the zeroes of the polynomial $x^2 - 6x + a$ and $\alpha\beta = 4$, then find 'a'.
- (a) 2 (b) -4 (c) 4 (d) -2
95. (CBSE 2021) Find the value of x in the polynomial $2a^2 + 2xa + 5a + 10$ if $(a + x)$ is one of its factors.
- (a) 2 (b) -2 (c) 5 (d) -5
96. (CBSE 2020) If α and β are zeroes of the polynomial $x^2 - p(x+1) + c$ such that $(\alpha + 1)(\beta + 1) = 0$, then the value of c is:
- (a) 1 (b) -1 (c) 0 (d) p
97. (CBSE 2023) The maximum number of zeroes a cubic polynomial can have is:
- (a) 1 (b) 2 (c) 3 (d) 4
98. (CBSE 2024) The zeroes of the polynomial $x^2 - 15$ are:
- (a) 15, -15 (b) $\sqrt{15}$, $-\sqrt{15}$ (c) $\sqrt{15}$, $\sqrt{15}$ (d) 15, 15
99. (CBSE 2022) If the graph of a polynomial intersects the x -axis at exactly 3 points, the number of distinct zeroes is:
- (a) 1 (b) 2 (c) 3 (d) 4
100. (CBSE 2020) If α and β are the zeroes of a quadratic polynomial $f(x) = kx^2 + 4x + 4$, such that $\alpha^2 + \beta^2 = 24$, find the value of k .
- (a) 1, $2/3$ (b) -1, $2/3$ (c) -1, $-2/3$ (d) 1, $-2/3$

CHAPTER 3: PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

--- EASY TYPE (1 to 10) ---

101. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has:
- (a) A unique solution (b) Exactly two solutions
(c) Infinitely many solutions (d) No solution
102. If a pair of linear equations is consistent, then the lines will be:
- (a) Parallel (b) Always coincident
(c) Intersecting or coincident (d) Always intersecting
103. The graph of the equation $x = -4$ is a line:
- (a) Parallel to the x -axis (b) Parallel to the y -axis

(c) Passing through the origin

(d) None of these

104. The pair of equations $y = 0$ and $y = -7$ has:

(a) One solution

(b) Two solutions

(c) Infinitely many solutions

(d) No solution

104. If the lines given by $3x + 2ky = 2$ and $2x + 5y = 1$ are parallel, then the value of k is:

(a) $-5/4$

(b) $2/5$

(c) $15/4$

(d) $3/2$

105. The solution of the equations $x + y = 14$ and $x - y = 4$ is:

(a) $x = 9, y = 5$

(b) $x = 5, y = 9$

(c) $x = 8, y = 6$

(d) $x = 10, y = 4$

106. Graphically, the pair of equations $6x - 3y + 10 = 0$ and $2x - y + 9 = 0$ represents two lines which are:

(a) Intersecting at exactly one point

(b) Intersecting at exactly two points

(c) Coincident

(d) Parallel

107. The value of c for which the pair of equations $cx - y = 2$ and $6x - 2y = 3$ will have infinitely many solutions is:

(a) 3

(b) -3

(c) -12

(d) No value

108. Sum of two numbers is 35 and their difference is 13. Find the numbers.

(a) 24 and 11

(b) 25 and 10

(c) 22 and 13

(d) 20 and 15

109. Which of the following is a solution of the equation $2x + 3y = 12$?

(a) (3, 2)

(b) (2, 3)

(c) (0, 3)

(d) (4, 1)

--- MODERATE / MEDIOCRE TYPE (11 to 20) ---

111. Half the perimeter of a rectangular garden, whose length is 4 m more than its width, is 36 m. The dimensions of the garden are:

(a) 20 m, 16 m

(b) 16 m, 12 m

(c) 24 m, 20 m

(d) 30 m, 26 m

112. The pair of equations $x = a$ and $y = b$ graphically represents lines which are:

(a) Parallel

(b) Intersecting at (b, a)

(c) Coincident

(d) Intersecting at (a, b)

113. For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines?

(a) $1/2$

(b) $-1/2$

(c) 2

(d) -2

114. Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu now?

(a) 40, 10

(b) 50, 20

(c) 45, 15

(d) 60, 30

115. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages of the son and the father are, respectively:

(a) 4 and 24

(b) 5 and 30

(c) 6 and 36

(d) 3 and 24

116. The value of x and y satisfying the equations $32x + 33y = 34$ and $33x + 32y = 31$ respectively are:

(a) -1, 2

(b) -1, 4

(c) 1, -2

(d) -1, -2

117. If $3x + 4y : x + 2y = 9 : 4$, then $3x + 5y : 3x - y$ is equal to:

(a) 4:1

(b) 1:4

(c) 7:1

(d) 1:7

118. A fraction becomes $\frac{9}{11}$ if 2 is added to both the numerator and the denominator. If 3 is added to both the numerator and the denominator it becomes $\frac{5}{6}$. The fraction is:

- (a) $\frac{7}{9}$ (b) $\frac{5}{7}$ (c) $\frac{3}{5}$ (d) $\frac{9}{11}$

119. If $x = a$, $y = b$ is the solution of the equations $x - y = 2$ and $x + y = 4$, then the values of a and b are, respectively:

- (a) 3 and 5 (b) 5 and 3 (c) 3 and 1 (d) -1 and -3

120. What is the area of the triangle formed by the lines $x = 3$, $y = 4$ and $x = y$?

- (a) $\frac{1}{2}$ sq. units (b) 1 sq. unit (c) 2 sq. units (d) 4 sq. units

--- HOTS TYPE (21 to 30) ---

121. Find the values of p and q for which the following pair of linear equations has infinitely many solutions: $2x + 3y = 7$; $(p + q)x + (2p - q)y = 21$.

- (a) $p = 5$, $q = 1$ (b) $p = 1$, $q = 5$ (c) $p = 2$, $q = 3$ (d) $p = 3$, $q = 2$

122. A two-digit number is such that the product of its digits is 14. If 45 is added to the number, the digits interchange their places. The number is:

- (a) 72 (b) 27 (c) 35 (d) 53

123. Points A and B are 90 km apart from each other on a highway. A car starts from A and another from B at the same time. If they go in the same direction they meet in 9 hours and if they go in opposite directions they meet in $\frac{9}{7}$ hours. Find their speeds.

- (a) 40 km/hr, 30 km/hr (b) 50 km/hr, 40 km/hr (c) 60 km/hr, 50 km/hr (d) 70 km/hr, 60 km/hr

124. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test?

- (a) 15 (b) 20 (c) 25 (d) 30

125. The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the numbers.

- (a) 24 or 42 (b) 35 or 53 (c) 46 or 64 (d) 13 or 31

126. 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by one man alone and one boy alone to finish the work.

- (a) 140 days, 280 days (b) 120 days, 240 days (c) 100 days, 200 days (d) 150 days, 300 days

127. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. Determine the speed of the stream and that of the boat in still water.

- (a) 3 km/hr, 8 km/hr (b) 4 km/hr, 9 km/hr (c) 2 km/hr, 6 km/hr (d) 5 km/hr, 10 km/hr

128. The ratio of incomes of two persons is 9:7 and the ratio of their expenditures is 4:3. If each of them manages to save Rs 2000 per month, find their monthly incomes.

- (a) Rs 18000, Rs 14000 (b) Rs 9000, Rs 7000 (c) Rs 27000, Rs 21000 (d) Rs 15000, Rs 11000

129. Solve for x and y : $ax + by = a - b$; $bx - ay = a + b$.

- (a) $x = 1$, $y = -1$ (b) $x = -1$, $y = 1$ (c) $x = 1$, $y = 1$ (d) $x = -1$, $y = -1$

130. In a cyclic quadrilateral ABCD, $\angle A = (2x + 4)^\circ$, $\angle B = (y + 3)^\circ$, $\angle C = (2y + 10)^\circ$, $\angle D = (4x - 5)^\circ$. Find the value of x and y.

- (a) $x = 15, y = 25$ (b) $x = 20, y = 30$ (c) $x = 15, y = 30$ (d) $x = 10, y = 20$

--- CBSE BOARD EXAM PYQs (31 to 50) ---

131. (CBSE 2024) If the pair of linear equations $3x - 5y = 7$ and $6x - 10y = 7$ has no solution, then the lines are:
(a) Parallel (b) Intersecting (c) Coincident (d) Perpendicular

132. (CBSE 2023) The value of k for which the pair of equations $kx = y + 2$ and $6x = 2y + 3$ has infinitely many solutions is:

- (a) 3 (b) Does not exist (c) -3 (d) 4

133. (CBSE 2020) If a pair of linear equations is consistent, then the lines will be:

- (a) parallel (b) always coincident
(c) intersecting or coincident (d) always intersecting

134. (CBSE 2023) The lines representing the given pair of linear equations are non-intersecting. Which of the following statements is true?

- (a) $a_1/a_2 = b_1/b_2 = c_1/c_2$ (b) $a_1/a_2 = b_1/b_2 \neq c_1/c_2$
(c) $a_1/a_2 \neq b_1/b_2$ (d) $a_1/a_2 \neq b_1/b_2 = c_1/c_2$

135. (CBSE 2022) The solution of the pair of linear equations $x = y$ and $x + y = 6$ is:

- (a) $x = 2, y = 4$ (b) $x = 4, y = 2$ (c) $x = 3, y = 3$ (d) $x = 0, y = 6$

136. (CBSE 2021) Graphically, the pair of equations $7x - y = 5$; $21x - 3y = 10$ represents two lines which are:

- (a) intersecting at one point (b) parallel
(c) intersecting at two points (d) coincident

137. (CBSE 2020) The pair of equations $x = 4$ and $y = 3$ graphically represents lines which are:

- (a) parallel (b) intersecting at (3, 4) (c) coincident (d) intersecting at (4, 3)

138. (CBSE 2019) Find the value of k for which the pair of linear equations $3x + 2y = -5$ and $x - ky = 2$ has a unique solution.

- (a) $k \neq 2/3$ (b) $k = 2/3$ (c) $k \neq -2/3$ (d) $k = -2/3$

139. (CBSE 2023) One equation of a pair of dependent linear equations is $-5x + 7y = 2$. The second equation can be:

- (a) $10x + 14y + 4 = 0$ (b) $-10x - 14y + 4 = 0$ (c) $10x - 14y = -4$ (d) $10x + 14y = -4$

140. (CBSE 2024) Two numbers are in the ratio 5:6. If 8 is subtracted from each of the numbers, the ratio becomes 4:5. Then the numbers are:

- (a) 40, 48 (b) 15, 18 (c) 25, 30 (d) 40, 50

141. (CBSE 2022) For what value of p does the pair of linear equations $(p-3)x + 3y = p$ and $px + py = 12$ have infinitely many solutions?

- (a) 6 (b) 12 (c) 3 (d) 0

142. (CBSE 2020) If $2x + y = 23$ and $4x - y = 19$, find the values of $5y - 2x$.

- (a) 30 (b) -30 (c) 31 (d) 32

143. (CBSE 2018) If $am \neq bl$, then the system of equations $ax + by = c$ and $lx + my = n$ has:

- (a) a unique solution (b) no solution
(c) infinitely many solutions (d) may or may not have a solution

144. (CBSE 2023) The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages, in years, of the son and the father are, respectively:
(a) 4 and 24 (b) 5 and 30 (c) 6 and 36 (d) 3 and 24
145. (CBSE 2017) The value of k for which the system of equations $x + 2y = 3$ and $5x + ky + 7 = 0$ is inconsistent is:
(a) $-14/3$ (b) $2/5$ (c) 5 (d) 10
146. (CBSE 2021) What fraction becomes $1/3$ when 1 is subtracted from the numerator and it becomes $1/4$ when 8 is added to its denominator?
(a) $5/12$ (b) $3/7$ (c) $4/11$ (d) $7/15$
147. (CBSE 2019) Find the value of c for which the pair of equations $cx - y = 2$ and $6x - 2y = 3$ will have infinitely many solutions.
(a) 3 (b) -3 (c) -12 (d) no value
148. (CBSE 2020) The line represented by $x = 7$ is parallel to:
(a) x-axis (b) y-axis (c) both axes (d) none of these
149. (CBSE 2024) A pair of linear equations which has a unique solution $x = 2, y = -3$ is:
(a) $x + y = -1; 2x - 3y = -5$ (b) $2x + 5y = -11; 4x + 10y = -22$
(c) $2x - y = 1; 3x + 2y = 0$ (d) $x - 4y - 14 = 0; 5x - y - 13 = 0$
150. (CBSE 2023) If $21x + 47y = 110$ and $47x + 21y = 162$, then the value of $x - y$ is:
(a) 1 (b) 2 (c) 3 (d) -2

CHAPTER 4:

QUADRATIC EQUATIONS

--- EASY TYPE (1 to 10) ---

151. Which of the following is a quadratic equation?
(a) $x^2 - 3\sqrt{x} + 2 = 0$ (b) $x + 1/x = x^2$ (c) $x^2 + 1/x^2 = 5$ (d) $2x^2 - 5x = (x-1)^2$
152. The roots of the quadratic equation $x^2 - 3x - 10 = 0$ are:
(a) 2, -5 (b) -2, 5 (c) 2, 5 (d) -2, -5
153. The discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$ is:
(a) -8 (b) 8 (c) 10 (d) -10
154. If one root of the equation $x^2 + px + 12 = 0$ is 4, while the equation $x^2 + px + q = 0$ has equal roots, the value of q is:
(a) $49/4$ (b) 4 (c) 3 (d) 12
155. A quadratic equation $ax^2 + bx + c = 0$ has two distinct real roots if:
(a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac = 0$ (c) $b^2 - 4ac < 0$ (d) $b^2 - 4ac \leq 0$

156. The sum of the roots of the quadratic equation $3x^2 - 9x + 5 = 0$ is:

- (a) 3 (b) -3 (c) $5/3$ (d) $-5/3$

157. Find the value of k for which the quadratic equation $2x^2 + kx + 3 = 0$ has two real equal roots.

- (a) $\pm 2\sqrt{6}$ (b) $\pm \sqrt{6}$ (c) $\pm 2\sqrt{3}$ (d) $\pm 3\sqrt{2}$

158. Which of the following equations has 2 as a root?

- (a) $x^2 - 4x + 5 = 0$ (b) $x^2 + 3x - 12 = 0$ (c) $2x^2 - 7x + 6 = 0$ (d) $3x^2 - 6x - 2 = 0$

159. The roots of $100x^2 - 20x + 1 = 0$ are:

- (a) $1/10, 1/10$ (b) $-1/10, -1/10$ (c) $1/10, -1/10$ (d) 10, 10

160. If $1/2$ is a root of the equation $x^2 + kx - 5/4 = 0$, then the value of k is:

- (a) 2 (b) -2 (c) $1/4$ (d) $1/2$

--- MODERATE / MEDIOCRE TYPE (11 to 20) ---

161. The product of two consecutive positive integers is 306. The quadratic equation to find the integers is:

- (a) $x^2 + x - 306 = 0$ (b) $x^2 - x - 306 = 0$ (c) $x^2 + 2x - 306 = 0$ (d) $x^2 - 2x - 306 = 0$

162. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, the other two sides are:

- (a) 5 cm, 12 cm (b) 7 cm, 14 cm (c) 3 cm, 10 cm (d) 8 cm, 15 cm

163. If the roots of the equation $(a-b)x^2 + (b-c)x + (c-a) = 0$ are equal, then:

- (a) $2a = b + c$ (b) $2b = a + c$ (c) $2c = a + b$ (d) $a = b = c$

164. Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.

- (a) 12 (b) -8 (c) 8 (d) 10

165. Find the roots of the equation: $x - 1/x = 3, (x \neq 0)$

- (a) $(3 \pm \sqrt{13})/2$ (b) $(3 \pm \sqrt{5})/2$ (c) $(-3 \pm \sqrt{13})/2$ (d) $(-3 \pm \sqrt{5})/2$

166. The sum of the reciprocals of Rehman's ages, (in years) 3 years ago and 5 years from now is $1/3$. His present age is:

- (a) 7 years (b) 10 years (c) 5 years (d) 8 years

167. If α and β are the roots of the equation $x^2 - p(x + 1) - c = 0$, then $(\alpha + 1)(\beta + 1)$ is equal to:

- (a) c (b) $c - 1$ (c) $1 - c$ (d) $1 + c$

168. Find the value of p for which the quadratic equation $px(x - 2) + 6 = 0$ has equal roots.

- (a) 0 (b) 6 (c) 0, 6 (d) 3

169. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. The speed of the train is:

- (a) 30 km/h (b) 40 km/h (c) 45 km/h (d) 50 km/h

170. The roots of the quadratic equation $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ are:

- (a) $\sqrt{2}, 5\sqrt{2}$ (b) $-\sqrt{2}, -5\sqrt{2}$ (c) $-\sqrt{2}, 5\sqrt{2}$ (d) $\sqrt{2}, -5\sqrt{2}$

--- HOTS TYPE (21 to 30) --- 21.

171. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which the smaller tap can separately fill the tank.
(a) 15 hours (b) 25 hours (c) 20 hours (d) 30 hours
172. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m. Find its length and breadth.
(a) $L=7\text{m}$, $B=4\text{m}$ (b) $L=5\text{m}$, $B=2\text{m}$ (c) $L=6\text{m}$, $B=3\text{m}$ (d) $L=8\text{m}$, $B=5\text{m}$
173. Solve for x : $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$, $[a \neq 0, b \neq 0, x \neq 0, x \neq -(a+b)]$
(a) $-a, b$ (b) $a, -b$ (c) $-a, -b$ (d) a, b
174. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.
(a) 4 km/h (b) 5 km/h (c) 6 km/h (d) 8 km/h
175. The sum of the areas of two squares is 468 m^2 . If the difference of their perimeters is 24 m, find the sides of the two squares.
(a) 18m, 12m (b) 16m, 10m (c) 20m, 14m (d) 15m, 9m
176. If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ are equal, then:
(a) $a = 0$ or $a^3 + b^3 + c^3 = 3abc$ (b) $b = 0$ or $a^3 + b^3 + c^3 = 3abc$
(c) $c = 0$ or $a^3 + b^3 + c^3 = 3abc$ (d) $a = b = c$
177. A plane left 30 minutes later than its scheduled time and in order to reach the destination 1500 km away in time, it had to increase its speed by 100 km/h from the usual speed. Its usual speed is:
(a) 400 km/h (b) 500 km/h (c) 600 km/h (d) 750 km/h
178. Out of a group of swans, $\frac{7}{2}$ times the square root of the number are playing on the shore of a tank. The two remaining ones are playing in the water. What is the total number of swans?
(a) 4 (b) 9 (c) 16 (d) 25
179. A shopkeeper buys a number of books for Rs 80. If he had bought 4 more books for the same amount, each book would have cost Rs 1 less. How many books did he buy?
(a) 16 (b) 20 (c) 24 (d) 12
180. Solve for x : $9x^2 - 9(a+b)x + (2a^2 + 5ab + 2b^2) = 0$
(a) $(2a+b)/3, (a+2b)/3$ (b) $(a+b)/3, (2a+2b)/3$ (c) $(2a-b)/3, (a-2b)/3$ (d) $(a-b)/3, (2a-2b)/3$

--- CBSE BOARD EXAM PYQs (31 to 50) --- 31.

181. (CBSE 2024) Which of the following is not a quadratic equation?
(a) $(x - 2)^2 + 1 = 2x - 3$ (b) $x(x + 1) + 8 = (x + 2)(x - 2)$
(c) $x(2x + 3) = x^2 + 1$ (d) $(x + 2)^3 = x^3 - 4$
182. (CBSE 2023) The roots of the quadratic equation $x^2 - 0.04 = 0$ are:
(a) ± 0.2 (b) ± 0.02 (c) 0.4 (d) 2
183. (CBSE 2022) The nature of roots of the quadratic equation $9hx^2 - 6px + p^2 = 0$ (where $h > 0$) is:
(a) No real roots (b) Two equal real roots
(c) Two distinct real roots (d) More than two roots

184. (CBSE 2020) The value of k for which the quadratic equation $x^2 - 4x + k = 0$ has equal roots is:
 (a) 2 (b) 4 (c) -4 (d) ± 4
185. (CBSE 2019) If $x = 3$ is one root of the quadratic equation $x^2 - 2kx - 6 = 0$, then find the value of k .
 (a) $1/2$ (b) 1 (c) 2 (d) $-1/2$
186. (CBSE 2023) Find the value of p so that the quadratic equation $px(x-3) + 9 = 0$ has two equal roots.
 (a) 1 (b) 4 (c) 3 (d) 2
187. (CBSE 2021) The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has:
 (a) two distinct real roots (b) two equal real roots
 (c) no real roots (d) more than 2 real roots
188. (CBSE 2024) For what positive value of ' a ', the roots of the equation $x^2 - 2x + a = 0$ are equal?
 (a) 1 (b) -1 (c) 2 (d) 4
189. (CBSE 2018) If 1 is a root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$, then ab equals:
 (a) 3 (b) $-7/2$ (c) 6 (d) -3
190. (CBSE 2023) The discriminant of the quadratic equation $3x^2 - 2x + 1/3 = 0$ is:
 (a) 0 (b) 3 (c) $1/3$ (d) -2
191. (CBSE 2020) Which of the following equations has two distinct real roots?
 (a) $2x^2 - 3\sqrt{2}x + 9/4 = 0$ (b) $x^2 + x - 5 = 0$
 (c) $x^2 + 3x + 2\sqrt{2} = 0$ (d) $5x^2 - 3x + 1 = 0$
192. (CBSE 2022) If one root of the equation $2x^2 - kx + 1 = 0$ is $-1/2$, then the value of k is:
 (a) 3 (b) -3 (c) $5/2$ (d) $-5/2$
193. (CBSE 2023) The product of the roots of the quadratic equation $x^2 - 3x + 2 = 0$ is:
 (a) 3 (b) -3 (c) 2 (d) -2
194. (CBSE 2019) Find the roots of the quadratic equation $\sqrt{3}x^2 - 2x - \sqrt{3} = 0$.
 (a) $\sqrt{3}, -1/\sqrt{3}$ (b) $-\sqrt{3}, 1/\sqrt{3}$ (c) $\sqrt{3}/2, -\sqrt{3}$ (d) 1, $\sqrt{3}$
195. (CBSE 2024) If the difference of the roots of the quadratic equation $x^2 - ax + b = 0$ is 1, then:
 (a) $a^2 - 4b = -1$ (b) $a^2 - 4b = 1$ (c) $a^2 - 4b = 0$ (d) $a^2 - 4b = 4$
196. (CBSE 2017) Find the value of k for which the roots of the equation $3x^2 - 10x + k = 0$ are reciprocal of each other.
 (a) 3 (b) -3 (c) 10 (d) -10
197. (CBSE 2020) If one root of the quadratic equation $3x^2 - 10x + p = 0$ is $1/3$, then the value of p is:
 (a) 3 (b) -3 (c) $1/3$ (d) $-1/3$
198. (CBSE 2022) The sum of the roots of the quadratic equation $x^2 - x - 2 = 0$ is:
 (a) 1 (b) -1 (c) 2 (d) -2
199. (CBSE 2023) The condition for a quadratic equation $ax^2 + bx + c = 0$ to have equal roots is:
 (a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac < 0$ (c) $b^2 - 4ac = 0$ (d) $b^2 = 4a$

200. (CBSE 2024) If the sum and product of the roots of the equation $kx^2 + 6x + 4k = 0$ are equal, then $k = ?$
- (a) $-3/2$ (b) $3/2$ (c) $2/3$ (d) $-2/3$

CHAPTER 5: ARITHMETIC PROGRESSIONS (A.P.)

Easy Type Questions (1 to 10)

201. The common difference of the A.P. 3, 1, -1, -3, ... is:
- (a) -2 (b) 2 (c) -1 (d) 3
202. The 10th term of the A.P. 2, 7, 12, ... is:
- (a) 47 (b) 52 (c) 37 (d) 42
203. Which of the following is an A.P.?
- (a) 1, 3, 9, 27 (b) 2, 4, 8, 16 (c) $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}$ (d) $1^2, 2^2, 3^2, 4^2$
204. If the first term of an A.P. is 'a' and common difference is 'd', then its nth term is:
- (a) $a + nd$ (b) $a - (n-1)d$ (c) $a + (n-1)d$ (d) $a + (n+1)d$
205. The list of numbers -10, -6, -2, 2, ... is:
- (a) an A.P. with $d = -16$ (b) an A.P. with $d = 4$ (c) an A.P. with $d = -4$ (d) not an A.P.
206. The 21st term of the A.P. whose first two terms are -3 and 4 is:
- (a) 17 (b) 137 (c) 143 (d) -143
207. The sum of first five multiples of 3 is:
- (a) 45 (b) 55 (c) 65 (d) 75
208. If the common difference of an A.P. is 5, then what is $a_{18} - a_{13}$?
- (a) 5 (b) 20 (c) 25 (d) 30
209. The next term of the A.P. $\sqrt{7}, \sqrt{28}, \sqrt{63}, \dots$ is:
- (a) $\sqrt{70}$ (b) $\sqrt{84}$ (c) $\sqrt{97}$ (d) $\sqrt{112}$
210. The sum of first n odd natural numbers is:
- (a) n^2 (b) $n(n+1)$ (c) $2n-1$ (d) $n^2/2$

Moderate Type Questions (11 to 20)

211. Which term of the A.P. 21, 18, 15, ... is zero?
- (a) 6th (b) 7th (c) 8th (d) 9th
212. How many two-digit numbers are divisible by 3?
- (a) 25 (b) 30 (c) 32 (d) 36
213. If 4, x_1 , x_2 , x_3 , 28 are in A.P. then $x_3 = ?$
- (a) 19 (b) 23 (c) 22 (d) 24
214. If the nth term of an A.P. is $(2n + 1)$, then the sum of its first three terms is:
- (a) 6 (b) 15 (c) 12 (d) 21

215. If the sum of an A.P. is $3n^2 + 5n$, then its common difference is:
 (a) 6 (b) 4 (c) 2 (d) 8
216. Find the number of terms in the A.P.: 7, 13, 19, ..., 205.
 (a) 33 (b) 34 (c) 35 (d) 36
217. The 11th term from the last term of the A.P. 10, 7, 4, ..., -62 is:
 (a) 25 (b) -16 (c) -32 (d) 0
218. If 7 times the 7th term of an A.P. is equal to 11 times its 11th term, then its 18th term will be:
 (a) 7 (b) 11 (c) 18 (d) 0
219. 19. Which term of the A.P. 3, 15, 27, 39, ... will be 120 more than its 21st term?
 (a) 29th (b) 31st (c) 33rd (d) 35th
220. 20. Two A.P.s have the same common difference. The first term of one of these is -1 and that of the other is -8. The difference between their 4th terms is:
 (a) -1 (b) -8 (c) 7 (d) -9

HOTS Type Questions (21 to 30)

221. If the sum of first p terms of an A.P. is $ap^2 + bp$, find its common difference.
 (a) $2a$ (b) $2b$ (c) $a+b$ (d) $a-b$
222. In an A.P., if $a = 1$, $a_n = 20$ and $S_n = 399$, then n is:
 (a) 19 (b) 21 (c) 38 (d) 42
223. The sum of the first 15 multiples of 8 is:
 (a) 920 (b) 860 (c) 900 (d) 960
224. If the p th term of an A.P. is $1/q$ and the q th term is $1/p$, then its (pq) th term is:
 (a) -1 (b) 0 (c) 1 (d) pq
225. The sum of first n terms of two A.P.s are in the ratio $(3n + 8) : (7n + 15)$. The ratio of their 12th terms is:
 (a) 16:7 (b) 7:16 (c) 74:169 (d) 77:176
226. If the sum of three numbers in an A.P. is 9 and their product is 24, then the numbers are:
 (a) 2, 4, 6 (b) 1, 5, 3 (c) 2, 3, 4 (d) 1, 3, 5
227. The 9th term of an A.P. is 499 and 499th term is 9. The term which is equal to zero is:
 (a) 501th (b) 502nd (c) 508th (d) 510th
228. If the sum of first m terms of an A.P. is n and the sum of first n terms is m , then the sum of its first $(m+n)$ terms is:
 (a) $-(m+n)$ (b) $(m+n)$ (c) 0 (d) $m-n$
229. If $1/x+2$, $1/x+3$, $1/x+5$ are in A.P., then $x = ?$
 (a) 5 (b) 3 (c) 1 (d) -1
230. The middle most term of the A.P. -11, -7, -3, ..., 49 is:
 (a) 18 (b) 19 (c) 21 (d) 23

CBSE Board Exam PYQs (31 to 50)

231. (CBSE 2024) The 11th term of the A.P. $-5, -5/2, 0, 5/2, \dots$ is:
(a) -20 (b) 20 (c) -30 (d) 30
232. (CBSE 2024) In an A.P., if $d = -4$, $n = 7$, $a_n = 4$, then a is:
(a) 6 (b) 7 (c) 20 (d) 28
233. (CBSE 2023) In an A.P., if $a = 3.5$, $d = 0$, $n = 101$, then a_n will be:
(a) 0 (b) 3.5 (c) 103.5 (d) 104.5
234. (CBSE 2023) The next term of the A.P. $\sqrt{18}, \sqrt{50}, \sqrt{98}, \dots$ is:
(a) $\sqrt{146}$ (b) $\sqrt{128}$ (c) $\sqrt{162}$ (d) $\sqrt{200}$
235. (CBSE 2023) Find the 20th term from the last term of the A.P. 3, 8, 13, ..., 253.
(a) 158 (b) 153 (c) 163 (d) 148
236. (CBSE 2022) If the common difference of an A.P. is 3, then $a_{20} - a_{15}$ is:
(a) 5 (b) 3 (c) 15 (d) 20
237. (CBSE 2022) The sum of first 100 natural numbers is:
(a) 5050 (b) 5000 (c) 5055 (d) 5500
238. (CBSE 2024) Which term of the A.P. 27, 24, 21, ... is zero?
(a) 8th (b) 9th (c) 10th (d) 11th
239. (CBSE 2021) The 4th term from the end of the A.P. $-11, -8, -5, \dots, 49$ is:
(a) 37 (b) 40 (c) 43 (d) 58
240. (CBSE 2020) The sum of first n terms of an A.P. is $5n - n^2$. The n th term of the A.P. is:
(a) $6 - 2n$ (b) $2n - 6$ (c) $5 - 2n$ (d) $2n - 5$
241. (CBSE 2020) If $4/5, a, 2$ are three consecutive terms of an A.P., then the value of 'a' is:
(a) $1/5$ (b) $3/5$ (c) $7/5$ (d) $6/5$
242. (CBSE 2024) For what value of k will $k+9, 2k-1$ and $2k+7$ be consecutive terms of an A.P.?
(a) 18 (b) 16 (c) 12 (d) 8
243. (CBSE 2023) The common difference of an A.P. in which $a_{18} - a_{14} = 32$ is:
(a) 8 (b) -8 (c) -4 (d) 4
244. (CBSE 2022) How many two-digit numbers are divisible by 6?
(a) 15 (b) 16 (c) 14 (d) 17
245. (CBSE 2021) In an A.P., if the common difference is -4 and the seventh term is 4, then the first term is:
(a) 28 (b) 22 (c) 20 (d) 24
246. (CBSE 2024) The sum of first 20 odd natural numbers is:
(a) 100 (b) 210 (c) 400 (d) 420

247. (CBSE 2020) If the sum of the first m terms of an A.P. is same as the sum of its first n terms, then the sum of its first $(m+n)$ terms is:
- (a) 0 (b) $m+n$ (c) $m-n$ (d) mn
248. (CBSE 2023) Find the common difference of the A.P. $1/p, (1-p)/p, (1-2p)/p, \dots$
- (a) 1 (b) $1/p$ (c) -1 (d) $-1/p$
249. (CBSE 2024) The sum of all two-digit odd numbers is:
- (a) 2575 (b) 2475 (c) 2524 (d) 2425
250. (CBSE 2022) The first three terms of an A.P. are $3y - 1, 3y + 5$ and $5y + 1$. Then y equals:
- (a) -3 (b) 4 (c) 5 (d) 2

CHAPTER 6: TRIANGLES

Easy Type Questions (1 to 10)

251. All circles are:
- (a) congruent (b) similar (c) both a and b (d) none of these
252. Two polygons of the same number of sides are similar, if their corresponding angles are _____ and their corresponding sides are _____.
- (a) proportional, equal (b) equal, proportional
(c) equal, equal (d) proportional, proportional
253. If in $\triangle ABC$ and $\triangle DEF$, $AB/DE = BC/FD$, then they will be similar, when:
- (a) $\angle B = \angle E$ (b) $\angle A = \angle D$ (c) $\angle B = \angle D$ (d) $\angle A = \angle F$
254. In $\triangle ABC$, $DE \parallel BC$ (where D is on AB and E is on AC). If $AD/DB = 3/4$ and $AC = 15$ cm, then AE is:
- (a) $45/7$ cm (b) 9 cm (c) 10 cm (d) 6 cm
255. If $\triangle ABC \sim \triangle PQR$, perimeter of $\triangle ABC = 32$ cm, perimeter of $\triangle PQR = 48$ cm and $PR = 6$ cm, then AC is equal to:
- (a) 9 cm (b) 4 cm (c) 8 cm (d) 18 cm
256. $\triangle ABC \sim \triangle DEF$. If $AB = 4$ cm, $BC = 3.5$ cm, $CA = 2.5$ cm and $DF = 7.5$ cm, the perimeter of $\triangle DEF$ is:
- (a) 10 cm (b) 14 cm (c) 30 cm (d) 25 cm
257. In $\triangle ABC$, if $DE \parallel BC$, $AD = x$, $DB = x-2$, $AE = x+2$ and $EC = x-1$, then the value of x is:
- (a) 3 (b) 4 (c) 5 (d) 2
258. If two triangles are similar, their corresponding sides are in the ratio of 4:9. The ratio of their perimeters is:
- (a) 4:9 (b) 16:81 (c) 2:3 (d) 81:16
259. Which of the following is not a criterion for similarity of triangles?
- (a) SSS (b) SAS (c) AA (d) RHS
260. In a $\triangle ABC$, a line parallel to BC intersects AB and AC at D and E respectively. If $AD/AB = 1/3$, then AE/AC is:
- (a) $1/2$ (b) $1/3$ (c) $2/3$ (d) $3/1$

Moderate Type Questions (11 to 20)

261. In a trapezium ABCD with $AB \parallel CD$, the diagonals AC and BD intersect at O. If $AB = 2CD$, then the ratio of OA to OC is:
- (a) 1:2 (b) 2:1 (c) 1:4 (d) 4:1
262. A vertical stick 20 m long casts a shadow 10 m long on the ground. At the same time, a tower casts a shadow 50 m long on the ground. The height of the tower is:
- (a) 100 m (b) 120 m (c) 25 m (d) 200 m
263. If in two triangles ABC and PQR, $AB/QR = BC/PR = CA/PQ$, then:
- (a) $\triangle PQR \sim \triangle CAB$ (b) $\triangle PQR \sim \triangle ABC$ (c) $\triangle CBA \sim \triangle PRQ$ (d) $\triangle BCA \sim \triangle PQR$
264. In $\triangle ABC$, D and E are points on sides AB and AC respectively such that $DE \parallel BC$. If $AE = 2$ cm, $AD = 3$ cm and $BD = 4.5$ cm, then CE equals:
- (a) 1 cm (b) 2 cm (c) 3 cm (d) 4 cm
265. If $\triangle ABC \sim \triangle QRP$, $\angle A/\angle Q = 1$, $\angle B = 50^\circ$ and $\angle C = 70^\circ$, then $\angle P$ is:
- (a) 50° (b) 60° (c) 70° (d) 80°
266. ABCD is a trapezium such that $BC \parallel AD$ and $AB = 4$ cm. If the diagonals AC and BD intersect at O such that $AO/OC = DO/OB = 1/2$, then BC is:
- (a) 7 cm (b) 8 cm (c) 9 cm (d) 6 cm
267. In $\triangle ABC$ and $\triangle DEF$, $\angle B = \angle E$, $\angle F = \angle C$ and $AB = 3DE$. Then, the two triangles are:
- (a) congruent but not similar (b) similar but not congruent
(c) neither congruent nor similar (d) congruent as well as similar
268. In $\triangle PQR$, $ST \parallel QR$ such that $PS/SQ = 3/5$. If $PR = 28$ cm, then PT is:
- (a) 10.5 cm (b) 15 cm (c) 17.5 cm (d) 10 cm
269. Two line segments AC and BD intersect each other at the point P such that $PA = 6$ cm, $PB = 3$ cm, $PC = 2.5$ cm, $PD = 5$ cm, $\angle APB = 50^\circ$ and $\angle CDP = 30^\circ$. Then $\angle PBA$ is:
- (a) 50° (b) 30° (c) 100° (d) 80°
270. In figure (concept), if $\triangle ABC \sim \triangle EDF$ and $\triangle ABC$ is not similar to $\triangle DEF$, then which of the following is not true?
- (a) $BC \times EF = AC \times FD$ (b) $AB \times EF = AC \times DE$
(c) $BC \times DE = AB \times EF$ (d) $BC \times DE = AB \times FD$

HOTS Type Questions (21 to 30)

271. In an equilateral triangle ABC, D is a point on side BC such that $BD = 1/3 BC$. Which of the following is true? (Adapted for ratio/similarity concept without Pythagoras area proofs)
- (a) $AD = AB$ (b) $AD = BC/2$ (c) $9AD^2 = 7AB^2$ (d) $3AD = AB$

(Note: Statement (c) is a standard geometry fact often derived using altitude and similarity/Pythagoras)

272. ABC and BDE are two equilateral triangles such that D is the mid-point of BC. Ratio of the perimeters of triangles ABC and BDE is:
- (a) 2:1 (b) 1:2 (c) 4:1 (d) 1:4

273. If $\triangle ABC \sim \triangle PQR$ with $BC/QR = 1/3$, then PR/AC is:
- (a) $1/3$ (b) 3 (c) 9 (d) $1/9$
274. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, the length of her shadow after 4 seconds is:
- (a) 1.2 m (b) 1.6 m (c) 2.0 m (d) 2.4 m
275. In $\triangle ABC$, point D lies on AB and point E lies on AC such that $DE \parallel BC$. If $AD = 4x - 3$, $AE = 8x - 7$, $BD = 3x - 1$ and $CE = 5x - 3$, find the value of x.
- (a) 1 (b) $2/3$ (c) 1 or $-1/2$ (d) 1 or $2/3$
276. In $\triangle ABC$, AD is the bisector of $\angle A$ intersecting BC at D. If $AB = 6$ cm, $AC = 5$ cm and $BD = 3$ cm, then DC is:
- (a) 2.5 cm (b) 3.5 cm (c) 4 cm (d) 5 cm
277. Let $\triangle ABC \sim \triangle DEF$ and their perimeters be 36 cm and 24 cm respectively. If PQ is the median of $\triangle ABC$ and MN is the median of $\triangle DEF$, then $PQ : MN$ is:
- (a) 3:2 (b) 2:3 (c) 9:4 (d) 4:9
278. Diagonals of a trapezium PQRS intersect each other at the point O, $PQ \parallel RS$ and $PQ = 3RS$. The ratio of $PO:RO$ is:
- (a) 1:3 (b) 3:1 (c) 1:9 (d) 9:1
279. In a right triangle ABC right-angled at B, a perpendicular BD is drawn to AC. Then which of the following is true?
- (a) $\triangle ADB \sim \triangle CDB$ (b) $\triangle ADB \sim \triangle ABC$ (c) $\triangle CDB \sim \triangle CAB$ (d) All of the above
280. D, E, F are the midpoints of the sides AB, BC, CA respectively of $\triangle ABC$. Then $\triangle DEF$ is similar to $\triangle ABC$ in the ratio:
- (a) 1:4 (b) 1:2 (c) 2:1 (d) 4:1

CBSE Board Exam PYQs

281. (CBSE 2024) In $\triangle ABC$, $DE \parallel BC$. If $AD = 3$ cm, $AB = 7$ cm and $EC = 3$ cm, then the length of AE is:
- (a) 2 cm (b) 2.25 cm (c) 3.5 cm (d) 4 cm
282. (CBSE 2024) If $\triangle ABC \sim \triangle DEF$, $\angle A = 47^\circ$ and $\angle E = 83^\circ$, then $\angle C$ is:
- (a) 47° (b) 50° (c) 83° (d) 130°
283. (CBSE 2023) In $\triangle ABC$, $DE \parallel BC$. If $AD/DB = 2/3$ and $AC = 18$ cm, find AE.
- (a) 7.2 cm (b) 6 cm (c) 10.8 cm (d) 12 cm
284. (CBSE 2023) It is given that $\triangle ABC \sim \triangle PQR$. If $AB/PQ = 1/3$, then perimeter of $\triangle ABC$ / perimeter of $\triangle PQR$ is:
- (a) $1/3$ (b) $1/9$ (c) 3 (d) 9
285. (CBSE 2023) In the given figure (concept), two line segments AC and BD intersect each other at the point P such that $PA = 6$ cm, $PB = 3$ cm, $PC = 2.5$ cm, $PD = 5$ cm. If $\angle APB = 50^\circ$ and $\angle CDP = 30^\circ$, then $\angle PAB$ is:
- (a) 50° (b) 100° (c) 30° (d) 80°

286. (CBSE 2022) $\triangle ABC$ and $\triangle BDE$ are two equilateral triangles such that D is the mid-point of BC. Ratio of the sides of triangles ABC and BDE is:
- (a) 2:1 (b) 1:2 (c) 4:1 (d) 1:4
287. (CBSE 2022) If in two triangles ABC and DEF, $AB/DF = BC/FE = CA/ED$, then:
- (a) $\triangle ABC \sim \triangle DEF$ (b) $\triangle ABC \sim \triangle EDF$ (c) $\triangle ABC \sim \triangle EFD$ (d) $\triangle ABC \sim \triangle DFE$
288. (CBSE 2021) In $\triangle ABC$, D and E are points on the sides AB and AC respectively, such that $DE \parallel BC$. If $AD = x$, $DB = x-2$, $AE = x+2$ and $EC = x-1$, the value of x is:
- (a) 4 (b) 3 (c) 5 (d) 2
289. (CBSE 2024) A 15 m high tower casts a shadow 24 m long at a certain time and at the same time, a telephone pole casts a shadow 16 m long. Find the height of the telephone pole.
- (a) 10 m (b) 12 m (c) 8 m (d) 20 m
290. (CBSE 2020) If $\triangle ABC \sim \triangle PQR$, $AB = 6.5$ cm, $PQ = 10.4$ cm and perimeter of $\triangle ABC = 60$ cm, the perimeter of $\triangle PQR$ is:
- (a) 65 cm (b) 96 cm (c) 104 cm (d) 120 cm
291. (CBSE 2024) If $\triangle ABC \sim \triangle QRP$, $AB/QR = BC/RP = CA/PQ = 2/3$, then PR/BC is:
- (a) $2/3$ (b) $3/2$ (c) $4/9$ (d) $9/4$
292. (CBSE 2023) In $\triangle ABC$, $DE \parallel BC$ (D on AB, E on AC). If $AD = 4$ cm, $DB = 4.5$ cm and $AE = 8$ cm, find AC.
- (a) 9 cm (b) 17 cm (c) 12 cm (d) 8.5 cm
293. (CBSE 2021) Which of the following conditions is sufficient to prove that two triangles are similar?
- (a) All corresponding sides are equal (b) Two corresponding angles are equal
(c) Corresponding sides are parallel (d) None of the above
294. (CBSE 2020) In figure (concept), $MN \parallel BC$ and $AM : MB = 1 : 2$. Then $AN : NC$ is:
- (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 3 : 1
295. (CBSE 2024) D and E are respectively the points on the sides AB and AC of a triangle ABC such that $AD = 2$ cm, $BD = 3$ cm, $BC = 7.5$ cm and $DE \parallel BC$. Then, length of DE (in cm) is:
- (a) 2.5 (b) 3 (c) 5 (d) 6
296. (CBSE 2022) The lengths of the diagonals of a rhombus are 16 cm and 12 cm. Then, the length of the side of the rhombus is: (Uses similarity/Right triangle concepts)
- (a) 9 cm (b) 10 cm (c) 8 cm (d) 20 cm
297. (CBSE 2023) Two isosceles triangles have equal vertical angles and their corresponding sides are in the ratio 3:4. Their perimeters are in the ratio:
- (a) 9:16 (b) 3:4 (c) 16:9 (d) $\sqrt{3}:2$
298. (CBSE 2024) In a triangle ABC, $DE \parallel BC$. If $AD = 1.5$ cm, $DB = 3$ cm, $AE = 1$ cm, then EC is:
- (a) 2 cm (b) 3 cm (c) 1.5 cm (d) 4 cm
299. (CBSE 2021) In $\triangle ABC$, $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm. The angle B is: (Checks converse of pythagoras/similarity awareness)
- (a) 120° (b) 60° (c) 90° (d) 45°

300. (CBSE 2020) If $\triangle ABC$ is similar to $\triangle DEF$ such that $2AB = DE$ and $BC = 8$ cm, then EF is:

- (a) 16 cm (b) 12 cm (c) 8 cm (d) 4 cm

Chapter 7: Coordinate Geometry

Easy Type Questions (1 to 10)

301. The distance of the point $P(2, 3)$ from the x-axis is:

- (a) 2 (b) 3 (c) 1 (d) 5

302. The distance of the point $P(-6, 8)$ from the origin is:

- (a) 8 (b) $2\sqrt{7}$ (c) 10 (d) 6

303. The coordinates of the midpoint of the line segment joining the points $A(-2, 8)$ and $B(-6, -4)$ are:

- (a) $(-4, 2)$ (b) $(4, 2)$ (c) $(2, 4)$ (d) $(-4, -2)$

304. The distance between the points $A(0, 6)$ and $B(0, -2)$ is:

- (a) 6 (b) 8 (c) 4 (d) 2

305. Any point on the x-axis is of the form:

- (a) (x, y) (b) $(0, y)$ (c) $(x, 0)$ (d) (x, x)

306. The distance between the points (a, b) and $(-a, -b)$ is:

- (a) $a^2 + b^2$ (b) $2\sqrt{(a^2 + b^2)}$ (c) $\sqrt{(a^2 + b^2)}$ (d) 0

307. The intersection point of the x-axis and y-axis is called:

- (a) Abscissa (b) Ordinate (c) Origin (d) Quadrant

308. The distance of the point $(-3, -4)$ from the y-axis is:

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

309. The midpoint of the line segment joining $(3, 0)$ and $(-3, 0)$ is:

- (a) $(3, 3)$ (b) $(0, 0)$ (c) $(3, -3)$ (d) $(-3, 3)$

310. The perimeter of a triangle with vertices $(0, 4)$, $(0, 0)$ and $(3, 0)$ is:

- (a) 5 (b) 12 (c) 11 (d) $7 + \sqrt{5}$

Moderate Type Questions (11 to 20)

311. The point on the x-axis which is equidistant from $(-4, 0)$ and $(10, 0)$ is:

- (a) $(7, 0)$ (b) $(5, 0)$ (c) $(0, 0)$ (d) $(3, 0)$

312. The ratio in which the x-axis divides the line segment joining the points $(5, 4)$ and $(2, -3)$ is:

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

313. If the distance between the points $(4, p)$ and $(1, 0)$ is 5, then the value of p is:

- (a) 4 only (b) ± 4 (c) -4 only (d) 0

314. If $(1, 2)$, $(4, y)$, $(x, 6)$ and $(3, 5)$ are the vertices of a parallelogram taken in order, find x and y .

- (a) $x=6, y=3$ (b) $x=3, y=6$ (c) $x=6, y=2$ (d) $x=2, y=6$

315. The point which divides the line segment joining the points (7, -6) and (3, 4) in ratio 1 : 2 internally lies in the:
- (a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant
316. If the point P(k, 0) divides the line segment joining the points A(2, -2) and B(-7, 4) in the ratio 1:2, then the value of k is:
- (a) 1 (b) 2 (c) -2 (d) -1
317. A circle drawn with origin as the center passes through $(13/2, 0)$. The point which does not lie in the interior of the circle is:
- (a) $(-3/4, 1)$ (b) $(2, 7/3)$ (c) $(5, -1/2)$ (d) $(-6, 5/2)$
318. The line segment joining the points (3, -1) and (-6, 5) is trisected. The coordinates of point of trisection nearer to (3, -1) is:
- (a) (0, 1) (b) (-3, 3) (c) (1, 0) (d) (0, -1)
319. A line intersects the y-axis and x-axis at the points P and Q respectively. If (2, -5) is the mid-point of PQ, then the coordinates of P and Q are respectively:
- (a) (0, -5) and (2, 0) (b) (0, 10) and (-4, 0) (c) (0, 4) and (-10, 0) (d) (0, -10) and (4, 0)
320. The points A(9, 0), B(9, 6), C(-9, 6) and D(-9, 0) are the vertices of a:
- (a) Square (b) Rectangle (c) Rhombus (d) Trapezium

HOTS Type Questions (21 to 30)

321. If the point P(x, y) is equidistant from the points A(5, 1) and B(-1, 5), then the relation between x and y is:
- (a) $3x = 2y$ (b) $2x = 3y$ (c) $3x - 2y = 0$ (d) $3x - 2y = 2$
322. The ratio in which the point (-3, k) divides the line segment joining the points (-5, -4) and (-2, 3) is:
- (a) 2:1 (b) 1:2 (c) 3:2 (d) 2:3
323. In question 22, the value of k is:
- (a) $2/3$ (b) $1/3$ (c) $3/2$ (d) 1
324. Find the ratio in which the line $2x + 3y - 5 = 0$ divides the line segment joining the points (8, -9) and (2, 1).
- (a) 8:1 (b) 1:8 (c) 2:3 (d) 3:2
325. The distance between the points $(a \cos \theta + b \sin \theta, 0)$ and $(0, a \sin \theta - b \cos \theta)$ is:
- (a) $a^2 + b^2$ (b) $a + b$ (c) $a^2 - b^2$ (d) $\sqrt{a^2 + b^2}$
326. If $(a/3, 4)$ is the mid-point of the segment joining the points P(-6, 5) and R(-2, 3), then the value of a is:
- (a) -4 (b) -12 (c) 12 (d) -6
327. The vertices of a triangle are (-2, 0), (2, 3) and (1, -3). The triangle is:
- (a) Equilateral (b) Isosceles (c) Right-angled (d) Scalene
328. If the distance between the points (x, -1) and (3, 2) is 5, then the values of x are:
- (a) -7 or -1 (b) -7 or 1 (c) 7 or 1 (d) 7 or -1
329. A point P divides the join of A(5, -2) and B(9, 6) in the ratio 3:1. The coordinates of P are:
- (a) (4, 7) (b) (8, 4) (c) $(11/2, 5)$ (d) (12, 8)
330. The points (1, 1), (-2, 7) and (3, -3) are:

- (a) Vertices of an equilateral triangle (b) Collinear
(c) Vertices of an isosceles triangle (d) None of these

CBSE Board Exam PYQs (31 to 50)

331. (CBSE 2024) The distance of the point (4, 7) from the x-axis is:
(a) 4 (b) 7 (c) 11 (d) $\sqrt{65}$
332. (CBSE 2024) The coordinates of the point which divides the line segment joining the points A(4, -3) and B(8, 5) in the ratio 3:1 internally are:
(a) (7, 3) (b) (3, 7) (c) (6, 2) (d) (2, 6)
333. (CBSE 2023) The distance of the point (-1, 7) from the origin is:
(a) $\sqrt{50}$ (b) 7 (c) 1 (d) $\sqrt{48}$
334. (CBSE 2023) In what ratio does the x-axis divide the line segment joining the points A(3, 6) and B(12, -3)?
(a) 1:2 (b) 2:1 (c) 1:4 (d) 4:1
335. (CBSE 2022) The midpoint of the line segment joining the points A(-2, 8) and B(-6, -4) is:
(a) (-4, -6) (b) (2, 6) (c) (-4, 2) (d) (4, 2)
336. (CBSE 2024) If the distance between the points A(4, p) and B(1, 0) is 5 units, then the value(s) of p is(are):
(a) 4 only (b) -4 only (c) ± 4 (d) 0
337. (CBSE 2023) The point on the x-axis which is equidistant from (-4, 0) and (10, 0) is:
(a) (7, 0) (b) (5, 0) (c) (0, 0) (d) (3, 0)
338. (CBSE 2021) The coordinates of the point which is the reflection of the point (-3, 5) in the x-axis are:
(a) (3, 5) (b) (3, -5) (c) (-3, -5) (d) (-3, 5)
339. (CBSE 2024) The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is:
(a) 5 (b) 12 (c) 11 (d) $7 + \sqrt{5}$
340. (CBSE 2020) If the point P(x, y) is equidistant from the points A(5, 1) and B(-1, 5), then:
(a) $3x = 2y$ (b) $2x = 3y$ (c) $3x = 2y - 1$ (d) $3x - 2y = 2$
341. (CBSE 2022) The coordinates of the point where the line $2x - 3y = 6$ intersects the x-axis are:
(a) (0, -2) (b) (3, 0) (c) (2, 0) (d) (0, 3)
342. (CBSE 2023) The distance between the points (a, b) and (-a, -b) is:
(a) $a^2 + b^2$ (b) $2\sqrt{a^2 + b^2}$ (c) 0 (d) $\sqrt{a^2 + b^2}$
343. (CBSE 2024) If the points A(4, 3) and B(x, 5) lie on a circle with center O(2, 3), then the value of x is:
(a) 0 (b) 1 (c) 2 (d) 3
344. (CBSE 2021) The ratio in which the y-axis divides the line segment joining the points P(-4, 2) and Q(8, 3) is:
(a) 1:2 (b) 2:1 (c) 3:1 (d) 1:3
345. (CBSE 2020) If P(a/2, 4) is the midpoint of the line-segment joining the points A(-6, 5) and B(-2, 3), then the value of a is:
(a) -8 (b) 3 (c) -4 (d) 4
346. (CBSE 2023) The distance between the points (m, -n) and (-m, n) is:

- (a) $\sqrt{m^2 + n^2}$ (b) $2\sqrt{m^2 + n^2}$ (c) $m^2 + n^2$ (d) $2\sqrt{m + n}$

347. (CBSE 2024) The fourth vertex D of a parallelogram ABCD whose three vertices are A(-2, 3), B(6, 7) and C(8, 3) is:

- (a) (0, -1) (b) (0, 1) (c) (-1, 0) (d) (1, 0)

348. (CBSE 2022) A point P on the x-axis divides the line segment joining the points (4, 5) and (1, -3) in a certain ratio. The coordinates of P are:

- (a) (17/8, 0) (b) (23/8, 0) (c) (13/8, 0) (d) (15/8, 0)

349. (CBSE 2021) If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, then the values of x and y are:

- (a) x=6, y=3 (b) x=3, y=6 (c) x=6, y=2 (d) x=2, y=6

350. (CBSE 2020) The distance of the point P(-3, -4) from the origin is:

- (a) 3 (b) 4 (c) 5 (d) 7

CHAPTER 8: INTRODUCTION TO TRIGONOMETRY

Easy Type Questions (1 to 10)

351. If $\sin \theta = 3/5$, then the value of $\cos \theta$ is:

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

352. The value of $\tan 45^\circ$ is:

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

353. For any acute angle θ , the value of $\sin^2 \theta + \cos^2 \theta$ is:

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

354. The value of $\sec^2 60^\circ - \tan^2 60^\circ$ is:

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

355. The value of $\sin 30^\circ + \cos 60^\circ$ is:

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

356. If $\tan \theta = \sqrt{3}$, then the value of θ is:

- (a) 30° (b) 45° (c) 60° (d) 90°

357. The maximum value of $\sin \theta$ (where $0^\circ \leq \theta \leq 90^\circ$) is:

- (a) 1/2 (b) $\sqrt{3}/2$ (c) 1 (d) ∞

358. The value of $1 - \sin^2 30^\circ$ is:

- (a) 1/4 (b) 3/4 (c) 1/2 (d) 1

359. If $\cos A = 1/2$, then the value of $12 \cot^2 A$ is:

- (a) 12 (b) 4 (c) 3 (d) 6

360. If $3 \cot A = 4$, then $\tan A$ is:

(a) $3/4$ (b) $4/3$ (c) $3/5$ (d) $5/3$ **Moderate Type Questions (11 to 20)**361. If $15 \cot A = 8$, then the value of $\sin A$ is:(a) $8/17$ (b) $15/17$ (c) $17/15$ (d) $17/8$ 362. The value of $2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$ is:

(a) 1

(b) 2

(c) 0

(d) -1

363. If $\sin(A - B) = 1/2$ and $\cos(A + B) = 1/2$ (where $0^\circ < A+B \leq 90^\circ$, $A > B$), then A and B are:(a) $A = 60^\circ$, $B = 30^\circ$ (b) $A = 45^\circ$, $B = 15^\circ$ (c) $A = 30^\circ$, $B = 15^\circ$ (d) $A = 45^\circ$, $B = 30^\circ$ 364. The value of $(1 + \tan^2 \theta)(1 - \sin \theta)(1 + \sin \theta)$ is:

(a) 1

(b) 0

(c) -1

(d) 2

365. In $\triangle ABC$, right-angled at B, $AB = 24$ cm, $BC = 7$ cm. The value of $\sin A$ is:(a) $7/25$ (b) $24/25$ (c) $7/24$ (d) $25/7$ 366. If $\sqrt{3} \tan \theta = 1$, then the value of $\sin^2 \theta - \cos^2 \theta$ is:(a) $1/2$ (b) $-1/2$ (c) $1/3$ (d) $-1/3$ 367. The value of $(\sin 30^\circ + \cos 30^\circ) - (\sin 60^\circ + \cos 60^\circ)$ is:

(a) -1

(b) 0

(c) 1

(d) 2

368. Evaluate: $(\sec A + \tan A)(1 - \sin A)$ (a) $\sec A$ (b) $\sin A$ (c) $\operatorname{cosec} A$ (d) $\cos A$ 369. If $5 \tan \theta = 4$, then the value of $(5 \sin \theta - 3 \cos \theta) / (5 \sin \theta + 2 \cos \theta)$ is:(a) $1/6$ (b) $1/3$ (c) $2/3$ (d) $3/4$ 370. $9 \sec^2 A - 9 \tan^2 A$ is equal to:

(a) 1

(b) 9

(c) 8

(d) 0

HOTS Type Questions (21 to 30)371. If $\sin \theta + \sin^2 \theta = 1$, then the value of $\cos^2 \theta + \cos^4 \theta$ is:

(a) 0

(b) 1

(c) -1

(d) 2

372. If $\sec \theta + \tan \theta = x$, then $\tan \theta$ is equal to:(a) $(x^2 + 1) / 2x$ (b) $(x^2 - 1) / 2x$ (c) $(x^2 - 1) / x$ (d) $(x^2 + 1) / x$ 373. The expression $(1 - \tan^2 45^\circ) / (1 + \tan^2 45^\circ)$ is equal to:(a) $\tan 90^\circ$

(b) 1

(c) $\sin 45^\circ$

(d) 0

374. If $x = a \cos \theta$ and $y = b \sin \theta$, then $b^2 x^2 + a^2 y^2$ is equal to:(a) $a^2 b^2$ (b) ab (c) $a^4 b^4$ (d) $a^2 + b^2$ 375. The value of $(1 + \cot^2 A) / (1 + \tan^2 A)$ is:(a) $\tan^2 A$ (b) $\sec^2 A$ (c) $\operatorname{cosec}^2 A$ (d) $\cot^2 A$ 376. If $\sqrt{3} \sin \theta - \cos \theta = 0$ and $0^\circ < \theta < 90^\circ$, then the value of θ is:(a) 30° (b) 45° (c) 60° (d) 90°

377. If $\cot \theta + 1/\cot \theta = 2$, then the value of $\cot^2 \theta + 1/\cot^2 \theta$ is:

- (a) 1 (b) 2 (c) 3 (d) 4

378. If $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$ and $x \sin \theta = y \cos \theta$, then $x^2 + y^2$ is equal to:

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

379. The value of $(\operatorname{cosec} \theta - \cot \theta)^2$ is equal to:

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

380. If $\cos A + \cos^2 A = 1$, then the value of $\sin^2 A + \sin^4 A$ is:

- (a) 1 (b) $1/2$ (c) 2 (d) 3

CBSE Board Exam PYQs (31 to 50)

381. (CBSE 2024) If $\sin A = 1/2$, then the value of $\cot A$ is:

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

382. (CBSE 2024) The value of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is:

- (a) 0 (b) 1 (c) 2 (d) $1/2$

383. (CBSE 2023) If $4 \tan \theta = 3$, then the value of $(4 \sin \theta - \cos \theta) / (4 \sin \theta + \cos \theta)$ is:

- (a) $2/3$ (b) $1/3$ (c) $1/2$ (d) $3/4$

384. (CBSE 2023) The value of $2 \tan 30^\circ / (1 + \tan^2 30^\circ)$ is:

- (a) $\sin 60^\circ$ (b) $\cos 60^\circ$ (c) $\tan 60^\circ$ (d) $\sin 30^\circ$

385. (CBSE 2022) If $\cos(\alpha + \beta) = 0$, then $\sin(\alpha - \beta)$ can be reduced to:

- (a) $\cos \beta$ (b) $\cos 2\beta$ (c) $\sin \alpha$ (d) $\sin 2\alpha$

386. (CBSE 2024) $(\sec A + \tan A)(1 - \sin A)$ is equal to:

- (a) $\sec A$ (b) $\sin A$ (c) $\operatorname{cosec} A$ (d) $\cos A$

387. (CBSE 2023) If $\tan A = \sqrt{3}$, then the value of $\sec A$ is:

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

388. (CBSE 2021) $1 - \cos^2 \theta$ is equal to:

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

389. (CBSE 2024) If $\sin \theta = \cos \theta$, then the value of $2 \tan \theta + \cos^2 \theta$ is:

- (a) $5/2$ (b) $3/2$ (c) 1 (d) 2

390. (CBSE 2020) If $3x = \operatorname{cosec} \theta$ and $3/x = \cot \theta$, then the value of $3(x^2 - 1/x^2)$ is:

- (a) $1/3$ (b) 1 (c) 3 (d) $1/9$

391. (CBSE 2022) The value of $(\sin^2 30^\circ + \cos^2 30^\circ)$ is:

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

392. (CBSE 2023) If $\triangle ABC$ is right angled at C, then the value of $\cos(A + B)$ is:

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

393. (CBSE 2024) If $\sin \alpha = 1/2$ and $\cos \beta = 1/2$, then the value of $(\alpha + \beta)$ is:
 (a) 0° (b) 30° (c) 60° (d) 90°
394. (CBSE 2021) In a right triangle ABC, right-angled at B, if $\tan A = 1$, then the value of $2 \sin A \cos A$ is:
 (a) 0 (b) 1 (c) $1/2$ (d) $\sqrt{3}/2$
395. (CBSE 2020) Given that $\sin \theta = a/b$, then $\cos \theta$ is equal to:
 (a) $b / \sqrt{(b^2 - a^2)}$ (b) b / a (c) $\sqrt{(b^2 - a^2)} / b$ (d) $a / \sqrt{(b^2 - a^2)}$
396. (CBSE 2023) If $x = p \sec \theta$ and $y = q \tan \theta$, then $x^2/p^2 - y^2/q^2$ is:
 (a) 1 (b) -1 (c) p/q (d) q/p
397. (CBSE 2024) The maximum value of $1/\operatorname{cosec} \theta$ is:
 (a) 0 (b) 1 (c) $\sqrt{3}/2$ (d) ∞
398. (CBSE 2022) If $\sin A + \cos B = 1$, $A = 30^\circ$ and B is an acute angle, then the value of B is:
 (a) 30° (b) 45° (c) 60° (d) 90°
399. (CBSE 2021) Value of $(1 + \tan^2 \theta) (1 - \sin^2 \theta)$ is:
 (a) 1 (b) -1 (c) $\sin^2 \theta$ (d) $\cos^2 \theta$
400. (CBSE 2020) If $\sqrt{3} \cot^2 \theta - 4 \cot \theta + \sqrt{3} = 0$, then the value of $\cot^2 \theta + \tan^2 \theta$ is:
 (a) $10/3$ (b) $3/10$ (c) 3 (d) 10

CHAPTER 9: SOME APPLICATIONS OF TRIGONOMETRY

Easy

401. The shadow of a 6m high pole is $2\sqrt{3}$ m long. The Sun's angle of elevation is:
 (A) 60° (B) 30° (C) 45° (D) 90°
402. A ladder placed against a wall makes an angle of 60° with the ground. If the foot of the ladder is 2m away from the wall, the length of the ladder is:
 (A) 2m (B) 4m (C) 3m (D) 5m
403. The ratio of the height of a vertical pole to the length of its shadow is $\sqrt{3}:1$. The Sun's elevation is:
 (A) 30° (B) 45° (C) 60° (D) 90°
404. A tower is 50m high. The angle of depression of a car on the ground is 30° . The distance of the car from the base of the tower is:
 (A) 50m (B) $50\sqrt{3}$ m (C) $50/\sqrt{3}$ m (D) 100m
405. The string of a kite is 100m long and makes an angle of 60° with the ground. The height of the kite is:
 (A) 50m (B) $50\sqrt{2}$ m (C) $50\sqrt{3}$ m (D) 100m
406. The angle of elevation of a tower from a point 30m from its base is 30° . The height of the tower is:
 (A) $10\sqrt{3}$ m (B) $20\sqrt{3}$ m (C) 15m (D) 30m

407. Two poles of height 16m and 10m are connected by a wire at their tops. If the wire makes an angle of 30° with the horizontal, the length of the wire is:
 (A) 10m (B) 12m (C) 14m (D) 26m
408. An observer 1.5m tall is 28.5m away from a 30m high chimney. The angle of elevation of the top from their eye is:
 (A) 30° (B) 45° (C) 60° (D) 90°
409. If the length of the shadow of a tree is equal to its height, the elevation of the sun is:
 (A) 30° (B) 45° (C) 60° (D) 90°
410. A bridge across a river makes a 45° angle with the river bank. If the length of the bridge is 150m, the width of the river is:
 (A) 75m (B) $75\sqrt{2}$ m (C) 150m (D) $150\sqrt{2}$ m

Mediocre

411. Two towers of height x and y subtend 30° and 60° respectively at the center of the line joining their bases. The ratio x:y is:
 (A) 1:3 (B) 3:1 (C) $1:\sqrt{3}$ (D) $\sqrt{3}:1$
412. The shadow of a tower becomes 20m longer when the Sun's elevation changes from 60° to 30° . The height of the tower is:
 (A) $10\sqrt{3}$ m (B) $20\sqrt{3}$ m (C) 10m (D) 20m
413. From the top of a 7m building, the elevation of the top of a cable tower is 60° and the depression of its foot is 45° . The tower height is:
 (A) $7(\sqrt{3}+1)$ m (B) $7\sqrt{3}$ m (C) 14m (D) $7(\sqrt{3}-1)$ m
414. The angles of depression of two ships from a 50m high lighthouse are 30° and 45° . The distance between the ships (on the same side) is:
 (A) $50(\sqrt{3}-1)$ m (B) $50(\sqrt{3}+1)$ m (C) 50m (D) 25m
415. A tree breaks due to a storm. Its top touches the ground at a 30° angle, 8m away from its base. The original height of the tree was:
 (A) $8\sqrt{3}$ m (B) $16\sqrt{3}$ m (C) 24m (D) 8m
416. The elevation of a tower from two points at distances 4m and 9m from the base are complementary. The tower height is:
 (A) 5m (B) 6m (C) 7m (D) 8m
417. A 1.6m tall statue stands on a pedestal. From a point, the elevation of the top of the statue is 60° and the top of the pedestal is 45° . The height of the pedestal is:
 (A) $0.8(\sqrt{3}+1)$ m (B) $0.8(\sqrt{3}-1)$ m (C) 1.6m (D) 3.2m
418. The elevation of a hill from the foot of a 50m tower is 60° , and the elevation of the tower from the foot of the hill is 30° . The hill's height is:
 (A) 100m (B) 150m (C) 50m (D) 200m
419. An airplane's elevation from the ground is 60° . After a 15-second flight at a height of $1500\sqrt{3}$ m, it changes to 30° . Its speed is:
 (A) 100 m/s (B) 200 m/s (C) 300 m/s (D) 150 m/s
420. From the top of a 50m tower, the angles of depression of the top and bottom of a pole are 45° and 60° . The height of the pole is:
 (A) $50(1 - 1/\sqrt{3})$ m (B) $50(\sqrt{3} - 1)$ m (C) $25(3 - \sqrt{3})$ m (D) 50m

HOTS

421. A bird is atop an 80m tree. Its elevation from a ground point is 45° . It flies horizontally for 2s, and the elevation becomes 30° . The bird's speed is:
(A) $40(\sqrt{3}-1)$ m/s (B) $40(\sqrt{3}+1)$ m/s (C) 80 m/s (D) 20 m/s
422. A boy on the ground spots a bird 100m away at a 30° elevation. A girl on a 20m roof opposite him spots it at 45° . The distance of the bird from the girl is:
(A) $30\sqrt{2}$ m (B) $40\sqrt{2}$ m (C) $20\sqrt{2}$ m (D) $50\sqrt{2}$ m
423. A spherical balloon of radius r subtends an angle θ at the observer's eye, and the elevation of its center is ϕ . The height of the center is:
(A) $r \sin \phi \csc(\theta/2)$ (B) $r \cos \phi \csc(\theta/2)$ (C) $r \sin \phi \sin(\theta/2)$ (D) $r \csc \phi \sin(\theta/2)$
424. The elevation of a tower from point A is α . Walking 'a' meters towards it to point B, the elevation is β . The tower height is:
(A) $a / (\cot \alpha - \cot \beta)$ (B) $a / (\cot \beta - \cot \alpha)$ (C) $a / (\tan \alpha - \tan \beta)$ (D) $a / (\tan \beta - \tan \alpha)$
425. A boat approaches a cliff uniformly. Its depression changes from 30° to 60° in 6 minutes. Time taken to reach the shore from there is:
(A) 3 mins (B) 2 mins (C) 4 mins (D) 1.5 mins
426. Two posts are k meters apart. One is twice as tall as the other. From the midpoint, their elevations are complementary. The shorter post's height is:
(A) $k\sqrt{2} / 4$ (B) $k / 2\sqrt{2}$ (C) $k / 4$ (D) $k\sqrt{2}$
427. An aircraft flies horizontally at 360 km/h. From the ground, its elevation is 45° . After 20s, it becomes 30° . Its height is:
(A) $1000(\sqrt{3}+1)$ m (B) $1000(\sqrt{3}-1)$ m (C) 2000m (D) 1500m
428. The elevation of a 60m tower from a building's base is 60° , and the building from the tower's base is 30° . The difference in their heights is:
(A) 20m (B) 30m (C) 40m (D) 50m
429. The elevation of a cloud from 60m above a lake is 30° , and the depression of its reflection is 60° . The cloud's height from the lake surface is:
(A) 120m (B) 180m (C) 90m (D) 150m
430. The angle of elevation of a stationary cloud from point h meters above a lake is α , and depression of its reflection is β . Cloud height is:
(A) $h(\tan \beta + \tan \alpha) / (\tan \beta - \tan \alpha)$ (B) $h(\tan \beta - \tan \alpha) / (\tan \beta + \tan \alpha)$
(C) $h \tan \alpha$ (D) $h \tan \beta$

CBSE Board Exam Questions

431. (CBSE 2023) The ratio of the length of a vertical pole and its shadow is $1:\sqrt{3}$. The angle of elevation of the Sun is:
- (A) 30° (B) 45° (C) 60° (D) 90°
432. (CBSE 2023) If a pole 6m high casts a shadow $2\sqrt{3}$ m long, the Sun's elevation is:
- (A) 60° (B) 45° (C) 30° (D) 90°
433. (CBSE 2020) If the angle of elevation of a tower from 100m away from its foot is 60° , the height of the tower is:
- (A) $100\sqrt{3}$ m (B) $100/\sqrt{3}$ m (C) $50\sqrt{3}$ m (D) $200/\sqrt{3}$ m
434. (CBSE 2020) The tops of two poles of height 16m and 10m are connected by a wire 'L'. If it makes 30° with the horizontal, 'L' is:
- (A) 26m (B) 16m (C) 12m (D) 10m
435. (CBSE 2019) A kite flies 30m above ground. The string length is 60m. The inclination of the string to the ground is:
- (A) 30° (B) 45° (C) 60° (D) 90°
436. (CBSE 2018) A 1.5m tall girl is 3m from a lamp-post and casts a 4.5m shadow. The lamp-post height is:
- (A) 1.5m (B) 2m (C) 2.5m (D) 2.8m
437. (CBSE 2017) The angle of depression of a car from a 150m high tower is 30° . Its distance from the tower is:
- (A) $50\sqrt{3}$ m (B) $150\sqrt{3}$ m (C) $150\sqrt{2}$ m (D) 75m
438. (CBSE 2017) A 15m ladder reaches the top of a wall, making a 60° angle with the wall. The wall's height is:
- (A) $15\sqrt{3}$ m (B) $15/2$ m (C) $15\sqrt{2}$ m (D) 15m
439. (CBSE 2016) The elevation of a 30m building from a second building's foot is 60° , and the second from the first's foot is 30° . The second building's height is:
- (A) 10m (B) 15m (C) 20m (D) 30m
440. (CBSE 2015) If the height of a pole is $\sqrt{3}$ times the length of its shadow, the Sun's elevation is:
- (A) 30° (B) 60° (C) 45° (D) 75°
441. (CBSE 2015) In a right triangle ABC right-angled at B, if $\tan A = 1$, then $2 \sin A \cos A$ is:
- (A) 0 (B) 1 (C) $1/2$ (D) 2
442. (CBSE 2014) The elevation of the Sun when the shadow of an h meters high pole is $\sqrt{3}$ h meters is:
- (A) 30° (B) 45° (C) 60° (D) 90°
443. (CBSE 2014) A pole casts a $2\sqrt{3}$ m shadow when the Sun's elevation is 60° . The pole height is:
- (A) 4m (B) 6m (C) 12m (D) 3m
444. (CBSE 2013) The depressions of two ships from a lighthouse are 45° and 30° . If they are 200m apart on the same side, the height is:
- (A) $100(\sqrt{3}+1)$ m (B) $100(\sqrt{3}-1)$ m (C) 200m (D) 100m

445. (CBSE 2013) A broken tree top touches the ground at 30° , 30m from the root. The original height is:
 (A) $10\sqrt{3}$ m (B) $20\sqrt{3}$ m (C) $30\sqrt{3}$ m (D) $40\sqrt{3}$ m
446. (CBSE 2012) The shadow of a tower is $\sqrt{3}$ times its height. The elevation of the Sun is:
 (A) 45° (B) 30° (C) 60° (D) 90°
447. (CBSE 2012) From 20m away from the foot of a tower, the elevation is 60° . The height is:
 (A) $20\sqrt{3}$ m (B) $20/\sqrt{3}$ m (C) $10\sqrt{3}$ m (D) 40m
448. (CBSE 2011) Two persons on opposite sides of a 50m tower observe elevations of 30° and 60° . The distance between them is:
 (A) $50\sqrt{3}$ (B) $50/\sqrt{3}$ (C) $200/\sqrt{3}$ (D) $100/\sqrt{3}$
449. (CBSE 2011) If the Sun's altitude is 60° , the height of a tower casting a 30m shadow is:
 (A) $30\sqrt{3}$ m (B) 15m (C) $30/\sqrt{3}$ m (D) $15\sqrt{2}$ m
450. (CBSE 2010) At 15m away from a 15m high house, the angle of elevation is:
 (A) 90° (B) 60° (C) 45° (D) 30°

CHAPTER 10: CIRCLES

Easy

451. A tangent to a circle intersects it in how many points?
 (A) 1 (B) 2 (C) 3 (D) 0
452. The lengths of two tangents drawn from an external point to a circle are:
 (A) Unequal (B) Equal (C) Parallel (D) Perpendicular
453. The angle between the radius and the tangent at the point of contact is:
 (A) 45° (B) 60° (C) 90° (D) 180°
454. A circle can have at most how many parallel tangents?
 (A) 1 (B) 2 (C) 3 (D) Infinite
455. The common point of a tangent and the circle is called the:
 (A) Center (B) Point of contact (C) Secant (D) Chord
456. The tangent from point Q is 24cm, and Q is 25cm from the center. The radius is:
 (A) 7cm (B) 12cm (C) 15cm (D) 24.5cm
457. If tangents PA and PB from P to a circle with center O are inclined at 80° , angle POA is:
 (A) 50° (B) 60° (C) 70° (D) 80°
458. In a 5cm radius circle, tangent AB at A has center O. If $OB = 13$ cm, length AB is:
 (A) 12cm (B) 10cm (C) 8cm (D) 144cm

459. A line intersecting a circle in two distinct points is called a:

- (A) Tangent (B) Secant (C) Chord (D) Radius

460. The number of tangents that can be drawn from a point inside a circle is:

- (A) 0 (B) 1 (C) 2 (D) Infinite

Mediocre

461. A quadrilateral ABCD is drawn to circumscribe a circle. Which is true?

- (A) $AB+BC = CD+DA$ (B) $AB+CD = BC+DA$ (C) $AC+BD = AB+CD$ (D) $AB = CD$

462. TP and TQ are tangents to a circle with center O. If angle POQ = 110° , angle PTQ is:

- (A) 60° (B) 70° (C) 80° (D) 90°

463. Two concentric circles have radii 5cm and 3cm. The length of the chord of the larger circle touching the smaller is:

- (A) 4cm (B) 6cm (C) 8cm (D) 10cm

464. If four sides of a quadrilateral ABCD are tangential to a circle, then:

- (A) $AC+AD = BD+CD$ (B) $AB+CD = BC+AD$ (C) $AB+CD = AC+BC$ (D) $AC+AD = BC+DB$

465. A circle touches sides of Triangle ABC at D, E, F. If $AB=10$, $BC=8$, $CA=12$, AD is:

- (A) 7 (B) 5 (C) 6 (D) 8

466. A circle touches all sides of quadrilateral ABCD where $AB=6\text{cm}$, $BC=7\text{cm}$, $CD=4\text{cm}$. AD is:

- (A) 3cm (B) 4cm (C) 5cm (D) 6cm

467. PA and PB are tangents from P. If angle APB = 60° , Triangle APB is:

- (A) Isosceles but not equilateral (B) Equilateral (C) Right-angled (D) Scalene

468. If the distance of P from center O equals the diameter, the angle between tangents PA and PB is:

- (A) 30° (B) 60° (C) 90° (D) 120°

469. The angle between two tangents from P is 120° . The ratio of tangent length to radius is:

- (A) $1:\sqrt{3}$ (B) $\sqrt{3}:1$ (C) 1:2 (D) 2:1

470. The distance between two parallel tangents of a circle of radius 4cm is:

- (A) 4cm (B) 6cm (C) 8cm (D) 10cm

HOTS

471. Triangle ABC circumscribes a 4cm radius circle. $BD=8\text{cm}$, $DC=6\text{cm}$. If Area is 84 cm^2 , AB and AC are:

- (A) 15cm, 13cm (B) 14cm, 12cm (C) 13cm, 11cm (D) 16cm, 14cm

472. Two circles of radii 5cm and 3cm touch internally. The distance between centers is:

- (A) 2cm (B) 8cm (C) 4cm (D) 5cm

473. Tangents PA and PB are 10cm. A third tangent cuts them at K and N. Perimeter of Triangle PKN is:

- (A) 10cm (B) 20cm (C) 15cm (D) 25cm

474. Tangent PQ at point P (radius 5cm) meets line through center O at Q such that OQ=12cm. PQ is:
 (A) 12cm (B) 13cm (C) 8.5cm (D) $\sqrt{119}$ cm
475. A circle touches sides of a right triangle (right angled at B) with AB=8, BC=6. The radius is:
 (A) 1cm (B) 2cm (C) 3cm (D) 4cm
476. AB is a diameter. Tangents at A and B intersect a tangent at P at points C and D. Angle COD is:
 (A) 45° (B) 60° (C) 90° (D) 120°
477. Tangent PT is 8cm. Distance of P from center is 10cm. Secant PAB has PA=5cm. AB is:
 (A) 7.8cm (B) 7.2cm (C) 6cm (D) 5cm
478. Tangents PA and PB from P. If angle OAB = 30° (O is center), angle APB is:
 (A) 30° (B) 60° (C) 90° (D) 120°
479. Two circles touch externally at P. Common tangent AB touches them at A and B. Angle APB is:
 (A) 30° (B) 45° (C) 60° (D) 90°
480. For concentric circles of radii 4cm and 5cm, the length of the chord tangent to the inner circle is:
 (A) 3cm (B) 6cm (C) 9cm (D) 12cm

CBSE Board Exam Questions

481. (CBSE 2023) Number of tangents from an external point to a circle is:
 (A) 1 (B) 2 (C) 3 (D) 4
482. (CBSE 2023) A line that intersects a circle at two distinct points is:
 (A) Tangent (B) Chord (C) Secant (D) Radius
483. (CBSE 2020) If the angle between two tangents from P to a circle (radius a, center O) is 60° , OP is:
 (A) a (B) $a\sqrt{3}$ (C) 2a (D) $a/\sqrt{3}$
484. (CBSE 2020) PQ is tangent at B. If angle AOB = 100° , then angle ABP is:
 (A) 50° (B) 40° (C) 60° (D) 80°
485. (CBSE 2019) Tangents PA and PB are drawn. If angle PAB = 50° , angle AOB is:
 (A) 50° (B) 100° (C) 130° (D) 80°
486. (CBSE 2019) The length of tangent from P to a circle with center O is always:
 (A) Equal to OP (B) Less than OP (C) Greater than OP (D) Half of OP
487. (CBSE 2018) Two concentric circles have radii 5cm and 3cm. Length of chord touching the smaller is:
 (A) 4cm (B) 8cm (C) 10cm (D) 6cm
488. (CBSE 2018) Tangents AB and AC are inclined at 40° . Angle BOC is:
 (A) 140° (B) 40° (C) 50° (D) 70°
489. (CBSE 2017) In a 7cm circle, tangent PT = 24cm. Distance of P from center is:
 (A) 25cm (B) 24cm (C) 30cm (D) 28cm
490. (CBSE 2017) If tangents PA and PB are inclined at 60° , angle POA is:
 (A) 30° (B) 60° (C) 90° (D) 120°

491. (CBSE 2016) P is 13cm from the center. Tangent is 12cm. Radius is:
 (A) 5cm (B) 7cm (C) 9cm (D) 11cm
492. (CBSE 2016) The tangents drawn at the ends of a diameter are:
 (A) Perpendicular (B) Parallel (C) Equal (D) Coincident
493. (CBSE 2015) Tangents PA and PB make angle $\text{APB} = 60^\circ$. Triangle PAB is:
 (A) Scalene (B) Right-angled (C) Equilateral (D) Isosceles
494. (CBSE 2015) If angle $\text{OAB} = 25^\circ$, then angle APB is:
 (A) 25° (B) 50° (C) 130° (D) 155°
495. (CBSE 2014) A parallelogram circumscribing a circle is always a:
 (A) Rectangle (B) Square (C) Rhombus (D) Trapezium
496. (CBSE 2014) Tangent PQ at P. If Triangle OPQ is isosceles, angle OQP is:
 (A) 30° (B) 45° (C) 60° (D) 90°
497. (CBSE 2013) Two tangents at 60° to a $\sqrt{3}$ cm radius circle. Length of each tangent is:
 (A) $\sqrt{3}$ cm (B) 3 cm (C) $2\sqrt{3}$ cm (D) 1 cm
498. (CBSE 2013) Tangents TP and TQ are drawn. Angle PTQ is equal to:
 (A) Angle OPQ (B) $2 \times \text{Angle OPQ}$ (C) $\frac{1}{2} \times \text{Angle OPQ}$ (D) Angle POQ
499. (CBSE 2012) The distance between two parallel tangents of a 3cm radius circle is:
 (A) 3cm (B) 4.5cm (C) 6cm (D) 9cm
500. (CBSE 2012) Radius is 5cm, tangent from P is 12cm. Distance of P from center is:
 (A) 13cm (B) 17cm (C) 7cm (D) 15cm

CHAPTER 11: AREAS RELATED TO CIRCLES

Easy

501. If the perimeter and the area of a circle are numerically equal, then the radius of the circle is:
 (A) 2 units (B) π units (C) 4 units (D) 7 units
502. The area of a circle whose radius is 7 cm is:
 (A) 154 cm^2 (B) 44 cm^2 (C) 308 cm^2 (D) 77 cm^2
503. What is the perimeter of a semi-circle of radius r?
 (A) πr (B) $\pi r + 2r$ (C) $2\pi r$ (D) πr^2
504. The formula for the area of a sector of angle θ of a circle with radius r is:
 (A) $(\theta/180) \times \pi r^2$ (B) $(\theta/360) \times 2\pi r$ (C) $(\theta/360) \times \pi r^2$ (D) $(\theta/180) \times 2\pi r$
505. The length of an arc of a sector of angle θ and radius r is:
 (A) $(\theta/360) \times \pi r^2$ (B) $(\theta/360) \times 2\pi r$ (C) $(\theta/180) \times \pi r$ (D) Both B and C

506. Distance covered by a circular wheel of radius r in one revolution is:

- (A) πr^2 (B) $2\pi r$ (C) πr (D) $4\pi r$

507. The area of a quadrant of a circle of radius r is:

- (A) $\pi r^2/2$ (B) $\pi r^2/4$ (C) πr^2 (D) $2\pi r$

508. If the radius of a circle is doubled, its area becomes:

- (A) 2 times (B) 4 times (C) 8 times (D) 16 times

509. Area of a ring bounded by two concentric circles of radii R and r ($R > r$) is:

- (A) $\pi(R^2 + r^2)$ (B) $\pi(R^2 - r^2)$ (C) $\pi(R - r)^2$ (D) $\pi(R + r)^2$

510. The angle described by the minute hand of a clock in 1 minute is:

- (A) 1° (B) 6° (C) 30° (D) 5°

Mediocre

511. The area swept by a minute hand of length 14 cm in 5 minutes is:

- (A) $154/3 \text{ cm}^2$ (B) 154 cm^2 (C) $77/3 \text{ cm}^2$ (D) $308/3 \text{ cm}^2$

512. A wheel has a radius of 0.25 m. The number of revolutions it will make to travel 11 km is:

- (A) 2800 (B) 4000 (C) 5500 (D) 7000

513. The area of a sector of a circle with radius 6 cm if the angle of the sector is 60° is:

- (A) $132/7 \text{ cm}^2$ (B) $154/7 \text{ cm}^2$ (C) $198/7 \text{ cm}^2$ (D) $44/7 \text{ cm}^2$

514. The perimeter of a quadrant of a circle of radius 14 cm is:

- (A) 22 cm (B) 44 cm (C) 50 cm (D) 72 cm

515. A wire is in the shape of a square of side 22 cm. If it is bent into a circle, its area is:

- (A) 2464 cm^2 (B) 1232 cm^2 (C) 616 cm^2 (D) 308 cm^2

516. If the circumferences of two circles are in the ratio 2:3, then their areas are in the ratio:

- (A) 2:3 (B) 4:9 (C) 9:4 (D) 8:27

517. The area of the largest circle that can be drawn inside a square of side 14 cm is:

- (A) 154 cm^2 (B) 196 cm^2 (C) 308 cm^2 (D) 616 cm^2

518. The area of a square inscribed in a circle of radius 8 cm is:

- (A) 64 cm^2 (B) 128 cm^2 (C) 256 cm^2 (D) 32 cm^2

519. If the area of a sector of a circle is $1/6$ of the area of the circle, the sector angle is:

- (A) 30° (B) 60° (C) 90° (D) 120°

520. The difference between the circumference and the radius of a circle is 37 cm. The area of the circle is (Take $\pi = 22/7$):

- (A) 154 cm^2 (B) 256 cm^2 (C) 308 cm^2 (D) 111 cm^2

HOTS

521. The length of the minute hand of a clock is 5 cm. The area swept by it from 6:05 am to 6:40 am is:

- (A) $275/6 \pi \text{ cm}^2$ (B) $275/12 \pi \text{ cm}^2$ (C) $175/6 \pi \text{ cm}^2$ (D) $175/12 \pi \text{ cm}^2$

522. Two circles touch externally. The sum of their areas is $130\pi \text{ cm}^2$ and the distance between their centers is 14 cm. The radii are:
- (A) 10 cm, 4 cm (B) 11 cm, 3 cm (C) 12 cm, 2 cm (D) 9 cm, 5 cm
523. The area of a circular path of uniform width h surrounding a circular region of radius r is:
- (A) $\pi h(2r + h)$ (B) $\pi h(2r - h)$ (C) $\pi r(2h + r)$ (D) $\pi r(2h - r)$
524. A cow is tied with a 14 m long rope at the corner of a rectangular field of dimensions $20 \text{ m} \times 16 \text{ m}$. The area of the field in which the cow can graze is:
- (A) 154 cm^2 (B) 154 m^2 (C) 308 m^2 (D) 616 m^2
525. The ratio of the areas of the incircle and circumcircle of a square is:
- (A) 1:2 (B) $1:\sqrt{2}$ (C) 1:3 (D) 1:4
526. If the radius of a circle is increased by 10%, its area increases by:
- (A) 10% (B) 20% (C) 21% (D) 100%
527. A chord of a circle of radius 12 cm subtends an angle of 120° at the center. The area of the corresponding segment of the circle is (Use $\pi = 3.14$, $\sqrt{3} = 1.73$):
- (A) 88.44 cm^2 (B) 89.24 cm^2 (C) 92.44 cm^2 (D) 90.64 cm^2
528. The perimeter of a sector of a circle of radius 5.2 cm is 16.4 cm. The area of the sector is:
- (A) 31.2 cm^2 (B) 15.6 cm^2 (C) 12.8 cm^2 (D) 20.4 cm^2
529. Water flows at the rate of 10 m/min through a cylindrical pipe 5 mm in diameter. How long would it take to fill a conical vessel whose diameter at the base is 40 cm and depth 24 cm?
- (A) 51 min 12 sec (B) 48 min 10 sec (C) 52 min 1 sec (D) 50 min
530. The radius of a circle is 20 cm. Three more concentric circles are drawn inside it in such a manner that it is divided into four parts of equal area. The radius of the largest of the three inner circles is:
- (A) $10\sqrt{3} \text{ cm}$ (B) 10 cm (C) $10\sqrt{2} \text{ cm}$ (D) $5\sqrt{3} \text{ cm}$

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531. (CBSE 2023) The perimeter of a sector of a circle of radius 21 cm which subtends an angle of 60° at the centre of the circle is:
- (A) 22 cm (B) 43 cm (C) 64 cm (D) 65 cm
532. (CBSE 2023) If the difference between the circumference and the radius of a circle is 37 cm, then using $\pi = 22/7$, the circumference of the circle is:
- (A) 154 cm (B) 44 cm (C) 14 cm (D) 7 cm
533. (CBSE 2022) The area of a quadrant of a circle, whose circumference is 22 cm, is:
- (A) $77/2 \text{ cm}^2$ (B) $77/4 \text{ cm}^2$ (C) $77/8 \text{ cm}^2$ (D) $77/16 \text{ cm}^2$
534. (CBSE 2022) Area of a sector of a circle is $1/6$ to the area of circle. The degree measure of its minor arc is:
- (A) 90° (B) 60° (C) 45° (D) 30°
535. (CBSE 2020) If the perimeter of a semicircular protractor is 36 cm, its diameter is (use $\pi = 22/7$):
- (A) 14 cm (B) 16 cm (C) 18 cm (D) 12 cm

536. (CBSE 2020) If the area of a circle is 154 cm^2 , then its perimeter is:
- (A) 11 cm (B) 22 cm (C) 44 cm (D) 55 cm
537. (CBSE 2019) The radius of a sphere (in cm) whose volume is $12\pi \text{ cm}^3$ is:
- (A) 3 (B) $3\sqrt{3}$ (C) $3^{2/3}$ (D) $3^{1/3}$
538. The circumference of a circle is 100 cm. The side of a square inscribed in the circle is:
- (A) $50\sqrt{2}/\pi \text{ cm}$ (B) $100/\pi \text{ cm}$ (C) $50\sqrt{2} \text{ cm}$ (D) $100\sqrt{2}/\pi \text{ cm}$
539. (CBSE 2019) The area of the circle that can be inscribed in a square of side 6 cm is:
- (A) $36\pi \text{ cm}^2$ (B) $18\pi \text{ cm}^2$ (C) $12\pi \text{ cm}^2$ (D) $9\pi \text{ cm}^2$
540. (CBSE 2018) Find the area of the corresponding major sector of a circle of radius 28 cm and central angle 45° :
- (A) 2156 cm^2 (B) 2464 cm^2 (C) 308 cm^2 (D) 1232 cm^2
541. (CBSE 2017) The area of a circle whose circumference is 22 cm is:
- (A) 38.5 cm^2 (B) 40 cm^2 (C) 22 cm^2 (D) 77 cm^2
542. (CBSE 2016) A pendulum swings through an angle of 30° and describes an arc 8.8 cm in length. Find the length of the pendulum.
- (A) 16.8 cm (B) 17.5 cm (C) 15 cm (D) 14 cm
543. (CBSE 2016) If the sum of the circumferences of two circles with radii R_1 and R_2 is equal to the circumference of a circle of radius R , then:
- (A) $R_1 + R_2 = R$ (B) $R_1^2 + R_2^2 = R^2$ (C) $R_1 + R_2 < R$ (D) $R_1^2 + R_2^2 < R^2$
544. (CBSE 2015) The number of revolutions made by a circular wheel of radius 0.7 m in rolling a distance of 176 m is:
- (A) 22 (B) 24 (C) 75 (D) 40
545. (CBSE 2015) If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R , then:
- (A) $R_1 + R_2 = R$ (B) $R_1^2 + R_2^2 = R^2$ (C) $R_1 + R_2 < R$ (D) $R_1^2 + R_2^2 < R^2$
546. (CBSE 2014) Perimeter of a sector of a circle of radius 10.5 cm and sector angle 60° is:
- (A) 32 cm (B) 21 cm (C) 11 cm (D) 42 cm
547. (CBSE 2014) An arc of a circle is of length $5\pi \text{ cm}$ and the sector it bounds has an area of $20\pi \text{ cm}^2$. Find the radius of the circle.
- (A) 4 cm (B) 8 cm (C) 12 cm (D) 16 cm
548. (CBSE 2013) The area of a quadrant of a circle whose circumference is 44 cm is:
- (A) 38.5 cm^2 (B) 77 cm^2 (C) 154 cm^2 (D) 22 cm^2
549. (CBSE 2012) If the perimeter of a circle is equal to that of a square, then the ratio of their areas is:
- (A) 22:7 (B) 14:11 (C) 7:22 (D) 11:14
550. (CBSE 2011) The radius of a circle is 50 cm. If the radius is decreased by 50%, its area will decrease by:
- (A) 50% (B) 75% (C) 25% (D) 100%

551. (CBSE 2011) A wheel has diameter 84 cm. The distance covered in 500 complete revolutions is:

- (A) 1320 m (B) 132 m (C) 13.2 m (D) 1.32 m

CHAPTER 12: SURFACE AREAS AND VOLUMES

Easy

552. The total surface area of a solid hemisphere of radius r is:

- (A) $2\pi r^2$ (B) $3\pi r^2$ (C) $4\pi r^2$ (D) $\frac{4}{3}\pi r^3$

553. The volume of a cylinder of radius r and height h is:

- (A) $\pi r^2 h$ (B) $\frac{1}{3}\pi r^2 h$ (C) $2\pi r h$ (D) $2\pi r(r+h)$

554. The curved surface area of a right circular cone of radius r and slant height l is:

- (A) $2\pi r l$ (B) $\pi r l$ (C) $\pi r(r+l)$ (D) $\frac{1}{3}\pi r^2 h$

555. The volume of a sphere of radius r is:

- (A) $\frac{4}{3}\pi r^3$ (B) $\frac{2}{3}\pi r^3$ (C) $4\pi r^2$ (D) $3\pi r^2$

556. If the volume of a cube is 216 cm^3 , its edge is:

- (A) 4 cm (B) 5 cm (C) 6 cm (D) 7 cm

557. The ratio of the volumes of two spheres is 8:27. The ratio of their radii is:

- (A) 2:3 (B) 4:9 (C) 3:2 (D) 9:4

558. A cylinder and a cone have the same base radius and same height. The ratio of their volumes is:

- (A) 1:3 (B) 3:1 (C) 2:3 (D) 3:2

559. The total surface area of a cube of edge a is:

- (A) $4a^2$ (B) $6a^2$ (C) a^3 (D) $8a^2$

560. The curved surface area of a hemisphere is:

- (A) πr^2 (B) $2\pi r^2$ (C) $3\pi r^2$ (D) $4\pi r^2$

561. The diagonal of a cuboid of dimensions l , b , h is:

- (A) $\sqrt{l^2+b^2+h^2}$ (B) $l+b+h$ (C) $\sqrt{l b h}$ (D) $2(lb+bh+hl)$

Mediocre

561. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm. The height of the cylinder is:

- (A) 2.4 cm (B) 2.74 cm (C) 1.4 cm (D) 3.1 cm

562. How many spherical lead shots of diameter 4 cm can be made out of a solid cube of lead whose edge measures 44 cm?

- (A) 2541 (B) 2540 (C) 2500 (D) 2550

563. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1 cm and the height of the cone is equal to its radius. The volume of the solid in terms of π is:

- (A) $\pi \text{ cm}^3$ (B) $2\pi \text{ cm}^3$ (C) $3\pi \text{ cm}^3$ (D) $\frac{4}{3}\pi \text{ cm}^3$

564. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. If the length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm, its surface area is:
- (A) 150 mm^2 (B) 220 mm^2 (C) 330 mm^2 (D) 200 mm^2
565. The ratio of the total surface area to the lateral surface area of a cylinder with base radius 80 cm and height 20 cm is:
- (A) 1:2 (B) 2:1 (C) 3:1 (D) 5:1
566. Three solid metallic spheres of radii 3 cm, 4 cm and 5 cm are melted to form a single solid sphere. The radius of the resulting sphere is:
- (A) 6 cm (B) 7 cm (C) 8 cm (D) 12 cm
567. Two cubes each of volume 64 cm^3 are joined end to end. The surface area of the resulting cuboid is:
- (A) 128 cm^2 (B) 160 cm^2 (C) 192 cm^2 (D) 256 cm^2
568. If two solid hemispheres of same base radius r are joined together along their bases, then curved surface area of this new solid is:
- (A) $4\pi r^2$ (B) $6\pi r^2$ (C) $3\pi r^2$ (D) $8\pi r^2$
569. The radii of the base of a cylinder and a cone are in the ratio 3:4 and their heights are in the ratio 2:3. Their volumes are in the ratio:
- (A) 9:8 (B) 8:9 (C) 3:4 (D) 4:3
570. A hollow cylindrical pipe is 21 cm long. Its outer and inner diameters are 10 cm and 6 cm respectively. The volume of metal used is:
- (A) 1056 cm^3 (B) 1100 cm^3 (C) 1050 cm^3 (D) 1200 cm^3 | Ans: A

HOTS

571. Coins of diameter 1.75 cm and thickness 2 mm are melted to form a cuboid of dimensions $5.5 \text{ cm} \times 10 \text{ cm} \times 3.5 \text{ cm}$. The number of coins is:
- (A) 200 (B) 300 (C) 400 (D) 500
572. A 20 m deep well with diameter 7 m is dug and the earth from digging is evenly spread out to form a platform 22 m by 14 m. The height of the platform is:
- (A) 2.5 m (B) 3.5 m (C) 4.5 m (D) 5.5 m
573. A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. The thickness (diameter) of the wire is:
- (A) $1/15 \text{ cm}$ (B) $1/30 \text{ cm}$ (C) $2/15 \text{ cm}$ (D) $1/5 \text{ cm}$
574. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?
- (A) 562500 m^2 (B) 550000 m^2 (C) 600000 m^2 (D) 450000 m^2
575. A hemispherical bowl of internal radius 9 cm is full of liquid. This liquid is to be filled into cylindrical small bottles each of diameter 3 cm and height 4 cm. How many bottles are necessary to empty the bowl?
- (A) 45 (B) 54 (C) 63 (D) 72
576. What is the volume of the largest right circular cone that can be cut out of a cube whose edge is 9 cm?
- (A) 190.93 cm^3 (B) 200 cm^3 (C) 180.5 cm^3 (D) 210.3 cm^3

577. A cylindrical tub of radius 12 cm contains water to a depth of 20 cm. A spherical iron ball is dropped into the tub and thus the level of water is raised by 6.75 cm. The radius of the ball is:
- (A) 6 cm (B) 8 cm (C) 9 cm (D) 7 cm
578. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and the diameter of the base is 4 cm. The difference between the volume of the circumscribing cylinder and the volume of the toy is:
- (A) $8\pi \text{ cm}^3$ (B) $4\pi \text{ cm}^3$ (C) $16\pi \text{ cm}^3$ (D) $12\pi \text{ cm}^3$
579. The ratio of the volume of a cube to that of a sphere which will exactly fit inside the cube is:
- (A) $6:\pi$ (B) $8:\pi$ (C) $\pi:6$ (D) $4:\pi$
580. If a cone is cut into two parts by a horizontal plane passing through the mid-point of its axis, the ratio of the volumes of the upper part and the original cone is:
- (A) 1:2 (B) 1:4 (C) 1:6 (D) 1:8

CBSE Board Exam Questions

581. (CBSE 2023) A solid cylinder of radius r and height h is melted and recast into the shape of a solid cone of base radius r . The height of the cone is:
- (A) h (B) $2h$ (C) $3h$ (D) $4h$
582. (CBSE 2023) The volume of a right circular cylinder with base radius 7 cm and height 10 cm is:
- (A) 1540 cm^3 (B) 1450 cm^3 (C) 154 cm^3 (D) 770 cm^3
583. (CBSE 2022) If two identical solid cubes of side a are joined end to end, then the total surface area of the resulting cuboid is:
- (A) $12a^2$ (B) $10a^2$ (C) $8a^2$ (D) $11a^2$
584. (CBSE 2022) The radius of a sphere (in cm) whose volume is $12\pi \text{ cm}^3$ is:
- (A) 3 (B) $3\sqrt{3}$ (C) $3^{(2/3)}$ (D) $3^{(1/3)}$
- * (Assuming cube root formatting: $3^{(2/3)}$ is correct as $r^3=9$)
- Correct options for standard font:
- (A) 3 (B) 2 (C) $3^{(2/3)}$ (D) 9
585. (CBSE 2020) If the radius of the base of a right circular cylinder is halved, keeping the height same, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is:
- (A) 1:2 (B) 2:1 (C) 1:4 (D) 4:1
586. (CBSE 2020) The total surface area of a solid hemisphere of radius 7 cm is:
- (A) 447 cm^2 (B) 462 cm^2 (C) 154 cm^2 (D) 308 cm^2
587. (CBSE 2019) A sphere of maximum volume is cut out from a solid cube of edge 6 cm. Find the volume of the cut out sphere.
- (A) $36\pi \text{ cm}^3$ (B) $72\pi \text{ cm}^3$ (C) $108\pi \text{ cm}^3$ (D) $12\pi \text{ cm}^3$
588. (CBSE 2019) Two cylindrical cans have equal base areas. If one of the can is 15 cm high and the other is 20 cm high, the ratio of their volumes is:
- (A) 3:4 (B) 4:3 (C) 9:16 (D) 16:9

589. (CBSE 2018) Volume 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
590. (CBSE 2018) If the volume of a cube is 1331 cm^3 , the length of its edge is:
 (A) 11 cm (B) 12 cm (C) 13 cm (D) 9 cm
591. (CBSE 2017) A solid metallic object is shaped like a double cone (two identical cones attached at base). Radius is r , height of each is h . Total volume is:
 (A) $\frac{1}{3} \pi r^2 h$ (B) $\frac{2}{3} \pi r^2 h$ (C) $\pi r^2 h$ (D) $\frac{4}{3} \pi r^2 h$
592. (CBSE 2017) Ratio of lateral surface area to total surface area of a cube is:
 (A) 1:2 (B) 2:3 (C) 3:4 (D) 1:3
593. (CBSE 2016) If the total surface area of a solid hemisphere is 462 cm^2 , find its volume (Take $\pi=22/7$).
 (A) 718.67 cm^3 (B) 700 cm^3 (C) 800.5 cm^3 (D) 720.67 cm^3
594. (CBSE 2016) A cone and a cylinder have the same radii but the height of the cone is 3 times that of the cylinder, then the ratio of their volumes is:
 (A) 1:1 (B) 1:2 (C) 1:3 (D) 3:1
562. (CBSE 2015) A solid sphere of radius r is melted and cast into the shape of a solid cone of height r , the radius of the base of the cone is:
 (A) $2r$ (B) $3r$ (C) r (D) $4r$
595. (CBSE 2015) A 20 m deep well with diameter 7 m is dug. Earth is spread to form a $22\text{m} \times 14\text{m}$ platform. The volume of earth dug out is:
 (A) 770 m^3 (B) 1540 m^3 (C) 385 m^3 (D) 700 m^3 | Ans: A
596. (CBSE 2014) The curved surface area of a cylinder is 264 m^2 and its volume is 924 m^3 . The ratio of its diameter to its height is:
 (A) 3:7 (B) 7:3 (C) 6:7 (D) 7:6
597. (CBSE 2013) A rectangular block $6 \text{ cm} \times 12 \text{ cm} \times 15 \text{ cm}$ is cut up into an exact number of equal cubes. The least possible number of cubes will be:
 (A) 6 (B) 11 (C) 33 (D) 40
598. (CBSE 2012) Three solid spheres of radii 3cm, 4cm, and 5cm are melted to form a single sphere. The volume of the new sphere is:
 (A) $288\pi \text{ cm}^3$ (B) $144\pi \text{ cm}^3$ (C) $72\pi \text{ cm}^3$ (D) $576\pi \text{ cm}^3$
599. (CBSE 2011) The radius of a wire is decreased to one-third. If volume remains the same, length will increase by:
 (A) 3 times (B) 6 times (C) 9 times (D) 27 times

CHAPTER 13: STATISTICS

Easy

601. The empirical relationship between mean, median, and mode is:

- (A) Mode = 3 Median - 2 Mean (B) Mode = 2 Median - 3 Mean
(C) Mode = 3 Mean - 2 Median (D) Mode = Mean + Median | Ans: A

602. For the following distribution, the modal class is:

Marks: 0-10 | 10-20 | 20-30 | 30-40 | 40-50

No. of Students: 3 | 12 | 20 | 10 | 5

- (A) 10-20 (B) 20-30 (C) 30-40 (D) 0-10

603. The lower limit of the median class of the following data is:

Classes: 0-10 | 10-20 | 20-30 | 30-40 | 40-50

Frequency: 5 | 8 | 15 | 12 | 6

- (A) 10 (B) 20 (C) 30 (D) 0

604. The arithmetic mean of the first n natural numbers is:

- (A) $\frac{n+1}{2}$ (B) $\frac{n(n+1)}{2}$ (C) $\frac{n}{2}$ (D) $n + 1$

605. If the mean of observations $x, x + 3, x + 5, x + 7$, and $x + 10$ is 9, then the mean of the last three observations is:

- (A) 10.33 (B) 11 (C) 10 (D) 11.33

606. Mode is the:

- (A) Middle-most value (B) Most frequent value (C) Average value (D) Least frequent value

563. Construction of a cumulative frequency table is useful in determining the:

- (A) Mean (B) Median (C) Mode (D) All of these

607. If the mean of five observations $x, x + 2, x + 4, x + 6$, and $x + 8$ is 11, then x is:

- (A) 5 (B) 6 (C) 7 (D) 8

608. Which of the following cannot be determined graphically?

- (A) Mean (B) Median (C) Mode (D) Ogive

609. The median of a set of 9 distinct observations is 20. If each of the largest 4 observations is increased by 2, the median of the new set will:

- (A) Increase by 2 (B) Decrease by 2 (C) Remain same (D) Increase by 8

Mediocre

611. If the mean of a frequency distribution is 26.8 and the assumed mean is 25 with $\sum f_i = 50$, then $\sum f_i d_i$ is:

- (A) 90 (B) 80 (C) 900 (D) 45

612. In the formula for finding the mean of grouped data, $\bar{x} = a + \left(\frac{\sum f_i d_i}{\sum f_i} \right)$, d_i is given by:

- (A) $x_i - a$ (B) $a - x_i$ (C) $h(x_i - a)$ (D) $\frac{x_i - a}{h}$

613. If $\sum f_i = 20$, $\sum f_i x_i = 2p + 110$, and the mean is 7, then p is:
 (A) 15 (B) 10 (C) 20 (D) 25
614. The mean of 10 numbers is 20. If 5 is subtracted from every number, the new mean is:
 (A) 20 (B) 15 (C) 25 (D) 10
615. If the median of the data 21, 23, 25, x , $x + 2$, 35, 38, 40 (given in ascending order) is 28, find x :
 (A) 26 (B) 27 (C) 28 (D) 29
616. For a given data with mean 60 and median 50, the mode using empirical relation is:
 (A) 30 (B) 40 (C) 55 (D) 45
617. If the mean of frequency distribution is 7.5 and $\sum f_i x_i = 120 + 3k$, $\sum f_i = 30$, then k is:
 (A) 40 (B) 50 (C) 20 (D) 30
618. In a grouped frequency distribution, the class intervals are 1-5, 6-10, 11-15... The upper limit of the class 10.5-15.5 when converted to continuous class intervals is:
 (A) 15 (B) 15.5 (C) 16 (D) 14.5
619. If the sum of frequencies $\sum f_i$ is 50, median is 35, lower limit of median class is 30, frequency of median class is 20, and class size is 10, the cumulative frequency of preceding class is:
 (A) 14 (B) 15 (C) 16 (D) 17
620. The mean of the squares of first n natural numbers is:
 (A) $\frac{(n+1)(2n+1)}{6}$ (B) $\frac{n(n+1)}{2}$ (C) $\frac{(n+1)}{2}$ (D) $\frac{(2n+1)}{3}$

HOTS

- 621.** If the median of the distribution given below is 28.5, find the values of x and y if total frequency is 60.
 Classes: 0-10, 10-20, 20-30, 30-40, 40-50, 50-60
 Frequency: 5, x , 20, 15, y , 5
 What is the value of $x + y$?
 (A) 15 (B) 10 (C) 20 (D) 25
622. The mean of 5 observations is m and variance is v . If each observation is multiplied by 3, the new mean and variance become:
 (A) $3m, 3v$ (B) $3m, 9v$ (C) $m, 9v$ (D) $3m, v$
623. If the mean of observations $1, 2, 3, \dots, n$ is $\frac{n+1}{2}$, what is the mean of their cubes?
 (A) $\frac{n^2(n+1)^2}{4}$ (B) $\frac{n(n+1)^2}{4}$ (C) $\frac{n(2n+1)}{3}$ (D) $\frac{n^2(2n+1)^2}{4}$
624. The average weight of students in a class of 35 students is 40 kg. If the weight of the teacher is included, the average rises by 1 kg. The teacher's weight is:
 (A) 75 kg (B) 76 kg (C) 74 kg (D) 72 kg
625. If the coefficient of variation is 60 and the standard deviation is 21, the arithmetic mean of the distribution is:
 (A) 35 (B) 30 (C) 40 (D) 45
626. The median of a series of 20 numbers is 25. If each number is increased by 5 and then multiplied by 2, the median of the new series will be:
 (A) 55 (B) 60 (C) 50 (D) 65

627. In a moderately skewed distribution, the difference between mean and median is 2. The difference between median and mode is:
- (A) 2 (B) 4 (C) 6 (D) 8
628. The mean of 8 observations is 10. If two observations 6 and 9 are excluded, the mean of the remaining observations is:
- (A) 10.5 (B) 11 (C) 11.5 (D) 12
629. A student calculates the mean of 10 observations as 40. Later it was found that an observation 50 was wrongly read as 30. The correct mean is:
- (A) 41 (B) 42 (C) 39 (D) 40.5
630. If the total number of observations is 50, cumulative frequency just greater than $N/2$ (i.e., 25) lies in the class 20-30, and the preceding cumulative frequency is 17, frequency of median class is 14, then the median is:
- (A) 25.71 (B) 26.25 (C) 24.5 (D) 27.15

CBSE Board Exam Questions

631. (CBSE 2023) The median and mode of a data are 24 and 12 respectively. Then its mean is:
- (A) 25 (B) 30 (C) 32 (D) 30
632. (CBSE 2023) If the mean of the observations $x, x + 3, x + 5, x + 7$, and $x + 10$ is 9, then the mean of the last three observations is:
- (A) 10.33 (B) 11 (C) 10 (D) 11.33
633. (CBSE 2022) For the following distribution, the modal class is:
- Classes: 0-5 | 5-10 | 10-15 | 15-20 | 20-25
 Frequency: 10 | 15 | 12 | 20 | 9
- (A) 5-10 (B) 10-15 (C) 15-20 (D) 20-25
634. (CBSE 2020) Construction of a cumulative frequency table is useful in determining the:
- (A) Mean (B) Median (C) Mode (D) All of these
635. (CBSE 2020) If mode = 80 and mean = 110, then median is:
- (A) 100 (B) 105 (C) 95 (D) 90
636. (CBSE 2019) The abscissa of the point of intersection of the more than type and less than type cumulative frequency curves of grouped data gives its:
- (A) Mean (B) Median (C) Mode (D) All of these
637. (CBSE 2019) If the mean of the frequency distribution is 7.5 and $\sum f_i x_i = 120 + 3k$, $\sum f_i = 30$, then k is:
- (A) 40 (B) 50 (C) 20 (D) 30
638. (CBSE 2018) Which of the following cannot be determined graphically?
- (A) Mean (B) Median (C) Mode (D) None of these
639. (CBSE 2018) The mean of first five prime numbers is:
- (A) 5 (B) 5.6 (C) 7.2 (D) 6.4
640. (CBSE 2017) If the mean of $x, x + 2, x + 4, x + 6$, and $x + 8$ is 11, then x is:
- (A) 5 (B) 6 (C) 7 (D) 8

641. (CBSE 2017) The median of first 10 prime numbers is:
 (A) 11 (B) 12 (C) 13 (D) 12.5
642. (CBSE 2016) If mode of a series is 30 and median is 35, its mean is:
 (A) 30 (B) 35 (C) 37.5 (D) 40
643. (CBSE 2016) The upper limit of the median class of a frequency distribution is given by:
 (A) Ogive (B) Frequency polygon (C) Histogram (D) Bar graph
644. (CBSE 2015) If the mean of observations $x_1, x_2, \dots, x_n$ is $\bar{x}$, then the mean of $x_1 + a, x_2 + a, \dots, x_n + a$ is:
 (A) $\bar{x}$ (B) $\bar{x} + a$ (C) $a\bar{x}$ (D) $\bar{x}/a$
645. (CBSE 2015) The cumulative frequency table is required to find:
 (A) Mean (B) Mode (C) Median (D) All of these
646. (CBSE 2014) If the difference of mode and median of a data is 24, then the difference of median and mean is:
 (A) 12 (B) 24 (C) 8 (D) 36
647. (CBSE 2014) The class mark of a class interval is given by:
 (A) $\frac{\text{Upper limit} + \text{Lower limit}}{2}$ (B) Upper limit – Lower limit
 (C) $\frac{\text{Upper limit} - \text{Lower limit}}{2}$ (D) Upper limit $\times$ Lower limit
648. (CBSE 2013) Mode is the:
 (A) Most frequent value (B) Middle value (C) Least frequent value (D) Average value
649. (CBSE 2012) If the mean of six numbers is 30, and one number is excluded, the mean becomes 28. The excluded number is:
 (A) 35 (B) 40 (C) 42 (D) 45
650. (CBSE 2011) The median of the data: 15,14,19,20,16,18,17 is:
 (A) 17 (B) 16 (C) 18 (D) 17.5 | Ans: A

CHAPTER 14: PROBABILITY

Easy

651. The probability of an impossible event is:
 (A) 1 (B) 0 (C) 0.5 (D) -1
652. The probability of a sure (certain) event is:
 (A) 0 (B) 1 (C) Between 0 and 1 (D) Cannot be determined
653. For any event E , the relation between $P(E)$ and $P(\text{not } E)$ is:
 (A) $P(E) - P(\text{not } E) = 1$ (B) $P(E) + P(\text{not } E) = 1$
 (C) $P(E) = P(\text{not } E)$ (D) $P(E) + P(\text{not } E) = 0$
654. Which of the following cannot be the probability of an event?
 (A) $\frac{2}{3}$ (B) -1.5 (C) 15% (D) 0.7

655. A card is drawn from a well-shuffled deck of 52 playing cards. The probability of getting a red face card is:

- (A) $\frac{3}{26}$ (B) $\frac{3}{13}$ (C) $\frac{1}{26}$ (D) $\frac{3}{52}$

656. When a die is thrown once, the probability of getting a prime number is:

- (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{6}$ (D) $\frac{2}{3}$

657. A bag contains 3 red and 5 black balls. A ball is drawn at random. The probability of getting a red ball is:

- (A) $\frac{3}{5}$ (B) $\frac{3}{8}$ (C) $\frac{5}{8}$ (D) $\frac{1}{3}$

658. The probability of getting a number greater than 6 in a single throw of a die is:

- (A) 1 (B) 0 (C) $\frac{1}{6}$ (D) $\frac{1}{2}$

659. Total number of face cards in a standard deck of 52 cards is:

- (A) 4 (B) 12 (C) 16 (D)

660. Two coins are tossed simultaneously. The probability of getting at least one head is:

- (A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) 1

Mediocre

661. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random, the probability that it bears a two-digit number is:

- (A) $\frac{9}{10}$ (B) $\frac{81}{90}$ (C) $\frac{9}{89}$ (D) $\frac{1}{10}$

662. The probability that a non-leap year selected at random will contain 53 Sundays is:

- (A) $\frac{1}{7}$ (B) $\frac{2}{7}$ (C) $\frac{5}{7}$ (D) $\frac{6}{7}$

663. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8. The probability that it will point at an odd number is:

- (A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{3}{4}$ (D) $\frac{5}{8}$

664. Cards marked with numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn. The probability that the number on the card is a perfect square is:

- (A) $\frac{1}{10}$ (B) $\frac{9}{100}$ (C) $\frac{1}{20}$ (D) $\frac{1}{25}$

665. If $P(E) = 0.05$, what is the probability of 'not E'?

- (A) 0.05 (B) 0.95 (C) 0.90 (D) 1.05

666. A lot of 20 bulbs contain 4 defective ones. One bulb is drawn at random. The probability that it is not defective is:

- (A) $\frac{1}{5}$ (B) $\frac{4}{5}$ (C) $\frac{3}{4}$ (D) $\frac{1}{4}$

667. A die is thrown twice. The probability that 5 will not come up either time is:

- (A) $\frac{25}{36}$ (B) $\frac{1}{36}$ (C) $\frac{11}{36}$ (D) $\frac{1}{6}$

668. From a pack of 52 cards, two cards are drawn. The probability that both are kings is:

- (A) $\frac{1}{221}$ (B) $\frac{1}{13}$ (C) $\frac{4}{13}$ (D) $\frac{2}{13}$

669. A box contains 5 red marbles, 8 white marbles, and 4 green marbles. One marble is taken out. The probability that it is not green is:

- (A) $\frac{4}{17}$ (B) $\frac{13}{17}$ (C) $\frac{5}{17}$ (D) $\frac{8}{17}$

670. Three unbiased coins are tossed together. The probability of getting at most two tails is:

- (A) $\frac{3}{8}$ (B) $\frac{7}{8}$ (C) $\frac{1}{8}$ (D) $\frac{3}{4}$

HOTS

671. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, the number of blue balls in the bag is:

- (A) 5 (B) 10 (C) 15 (D) 20

672. A child has a die whose six faces show the letters as given below: A, B, C, D, E, A. The die is thrown once. The probability of getting 'A' is:

- (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{6}$ (D) $\frac{2}{3}$

673. Two dice are thrown simultaneously. The probability of getting a sum divisible by 3 is:

- (A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{5}{18}$ (D) $\frac{7}{36}$

674. A leap year is selected at random. What is the probability that it contains 53 Sundays and 53 Mondays?

- (A) $\frac{1}{7}$ (B) $\frac{2}{7}$ (C) $\frac{1}{366}$ (D) 0

675. 12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random. The probability that it is a good pen is:

- (A) $\frac{12}{144}$ (B) $\frac{11}{12}$ (C) $\frac{1}{12}$ (D) $\frac{132}{132}$

676. A committee of 2 persons is selected from 2 men and 2 women. The probability that the committee has exactly one woman is:

- (A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{1}{2}$ (D) $\frac{3}{4}$

677. A card is drawn from a well-shuffled deck of 52 cards. The probability that the card is neither a king nor a red card is:

- (A) $\frac{6}{13}$ (B) $\frac{7}{26}$ (C) $\frac{3}{13}$ (D) $\frac{9}{26}$

678. Two numbers a and b are selected at random from the numbers $-2, -1, 0, 1, 2$. The probability that $ab < 0$ is:

- (A) $\frac{2}{5}$ (B) $\frac{3}{5}$ (C) $\frac{4}{25}$ (D) $\frac{6}{25}$

679. A box contains 10 cards numbered 1 to 10. A card is drawn. If it is known that the number on the card is greater than 5, the probability that it is an even number is:

- (A) $\frac{2}{5}$ (B) $\frac{3}{5}$ (C) $\frac{1}{2}$ (D) $\frac{3}{10}$

680. A game consists of tossing a one-rupee coin 3 times and noticing its outcome each time. Hanif wins if all the tosses give the same result (three heads or three tails), and loses otherwise. The probability that Hanif will lose the game is:

- (A) $\frac{1}{4}$ (B) $\frac{3}{4}$ (C) $\frac{1}{2}$ (D) $\frac{5}{8}$

CBSE Board Exam Questions

681. (CBSE 2023) Which of the following cannot be the probability of an event?
(A) $\frac{2}{3}$ (B) -1.5 (C) 15% (D) 0.7
682. (CBSE 2023) If the probability of an event E is 0.05 , then the probability of 'not E ' is:
(A) 0.05 (B) 0.95 (C) 0 (D) 1
683. (CBSE 2022) A card is drawn from a well-shuffled deck of 52 cards. The probability of getting a black face card is:
(A) $\frac{3}{26}$ (B) $\frac{3}{13}$ (C) $\frac{1}{26}$ (D) $\frac{1}{52}$
684. (CBSE 2022) The probability of getting a number greater than 4 in a throw of a die is:
(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{1}{2}$ (D) $\frac{1}{6}$
685. (CBSE 2020) If $P(E) = 0.35$, then $P(\text{not } E)$ is:
(A) 0.65 (B) 0.35 (C) 1 (D) 0
686. (CBSE 2020) A box contains 90 discs numbered 1 to 90 . One disc is drawn at random. The probability that it bears a prime number less than 23 is:
(A) $\frac{7}{90}$ (B) $\frac{8}{90}$ (C) $\frac{4}{45}$ (D) $\frac{9}{90}$
687. (CBSE 2019) The probability of getting a bad egg in a lot of 400 is 0.035 . The number of bad eggs in the lot is:
(A) 7 (B) 14 (C) 21 (D) 28
688. (CBSE 2019) A die is thrown once. The probability of getting a composite number is:
(A) $\frac{1}{3}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) $\frac{1}{6}$
689. (CBSE 2018) Two dice are thrown simultaneously. The probability of getting the same number on both dice is:
(A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{1}{36}$
690. (CBSE 2018) A card is drawn from a deck of 52 cards. The probability of getting a red card is:
(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{1}{13}$ (D) $\frac{3}{26}$
691. (CBSE 2017) A box contains 3 blue, 2 white, and 4 red marbles. If a marble is drawn at random, what is the probability that it is not white?
(A) $\frac{2}{9}$ (B) $\frac{7}{9}$ (C) $\frac{5}{9}$ (D) $\frac{4}{9}$
692. (CBSE 2017) Which of the following can be the probability of an occurrence of an event?
(A) 1.5 (B) $-\frac{1}{2}$ (C) 7% (D) $\frac{11}{10}$
693. (CBSE 2016) A card is drawn from a well-shuffled deck of 52 cards. The probability of getting a king of red colour is:
(A) $\frac{1}{26}$ (B) $\frac{1}{13}$ (C) $\frac{1}{52}$ (D) $\frac{3}{26}$

694. (CBSE 2016) The probability of selecting a rotten apple randomly from a heap of 900 apples is 0.18. The number of rotten apples is:
- (A) 162 (B) 180 (C) 150 (D) 140
695. (CBSE 2015) A letter of English alphabet is chosen at random. The probability that it is a letter of the word "MATHEMATICS" is:
- (A) $\frac{4}{26}$ (B) $\frac{11}{26}$ (C) $\frac{7}{26}$ (D) $\frac{5}{26}$
696. (CBSE 2015) A bag contains 4 red and 6 black balls. A ball is drawn at random. The probability of getting a black ball is:
- (A) $\frac{3}{5}$ (B) $\frac{2}{5}$ (C) $\frac{1}{2}$ (D) $\frac{4}{5}$
697. (CBSE 2014) Cards marked with numbers 1 to 50 are placed in a box and mixed thoroughly. A card is drawn at random. The probability that the number taken out is an odd prime is:
- (A) $\frac{3}{25}$ (B) $\frac{7}{50}$ (C) $\frac{4}{25}$ (D) $\frac{3}{50}$
698. (CBSE 2013) A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out at random. The probability that it is white is:
- (A) $\frac{5}{17}$ (B) $\frac{8}{17}$ (C) $\frac{4}{17}$ (D) $\frac{13}{17}$
699. (CBSE 2012) A die is thrown once. The probability of getting an even prime number is:
- (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{6}$ (D) 0
700. (CBSE 2011) Two coins are tossed simultaneously. The probability of getting at most one head is:
- (A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) 1