

SAMPLE QUESTION PAPER

CBSE 2025-26

MATHEMATICS BASIC

General Instructions :

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 38 questions. All Questions are compulsory.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and question no.19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required. Take $\pi = 22/7$ wherever required if not stated.
10. Use of calculators is not allowed.

Time Allowed : 3 hours

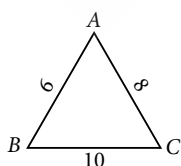
Maximum Marks : 70

SECTION A

(Multiple Choice Questions)

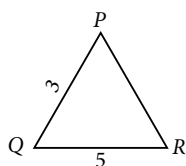
Each MCQ of 1 mark, has four options with only one correct option, choose the correct option.

1. How many maximum number of tangents can be constructed to a circle from a point lying outside the circle?
(a) 1 (b) 3
(c) 2 (d) None of these
2. In the given figure, $\triangle ABC \sim \triangle PQR$ then the value of PR is



(a) 4

(b) 6

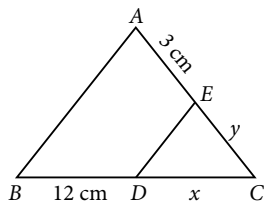


(c) 3

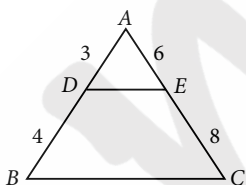
(d) 8

3. Find the discriminant of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$.
(a) 8 (b) 136 (c) 36 (d) 64
4. Find the coordinates of midpoint of the line segment joining the points $A(2, 2)$ and $B(-4, -4)$.
(a) (1, 1) (b) (-1, 1)
(c) (-1, -1) (d) (1, -1)
5. How many tangents can a circle have from a point lying inside it?
(a) Infinite (b) One
(c) Zero (d) Two
6. The value of $\tan^2 45^\circ + \cot^2 45^\circ$ is equal to
(a) $2\sqrt{2}$ (b) 2
(c) 1 (d) $1/\sqrt{2}$
7. The H.C.F. of 121 and 1001 is
(a) 121 (b) 7 (c) 13 (d) 11

8. In figure, $DE \parallel AB$. If $AE = 3$ cm and $BD = 12$ cm, then find $x : y$.



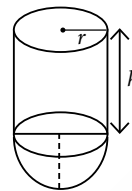
- (a) 3 : 1 (b) 1 : 3
(c) 4 : 1 (d) 1 : 4
9. If the product of zeroes of the polynomial $ax^2 - 6x - 6$ is 4, then the value of 'a' is
(a) $3/2$ (b) $2/3$
(c) $-2/3$ (d) $-3/2$
10. A tangent PQ at a point P of a circle of radius 7 cm meets a line through centre O at a point Q so that $OQ = 25$ cm. Length PQ is
(a) 20 cm (b) 14 cm
(c) 24 cm (d) 26 cm
11. Evaluate : $\sin^4 45^\circ$
(a) $1/2$ (b) $1/3$
(c) $1/4$ (d) $1/\sqrt{2}$
12. If areas of two concentric circles are 1386 cm^2 and 962.5 cm^2 , then area of ring so formed is
(a) 433.5 cm^2 (b) 423.5 cm^2
(c) 422.5 cm^2 (d) 420.3 cm^2
13. For the given triangle, which of the following is true?



- (a) $DE = BC$ (b) $DE \parallel BC$
(c) $DE = 1/2 BC$ (d) None of these
14. A solid is hemispherical at the bottom and conical (of same radius) above it. If the surface areas of the two parts are equal, then the ratio of its radius and the slant height of the conical part is
(a) 2 : 1 (b) 1 : 2 (c) 1 : 4 (d) 4 : 1
15. If $\sin \alpha = 1/2$, then find the value of $3 \sin \alpha - 4 \sin^3 \alpha$.
(a) 0 (b) 1 (c) -1 (d) 2
16. If the median of the data 20, 22, 23, 25, $24 + x$, $27 + x$, 31, 32, 34, 35 is 27.5, then the value of x is
(a) 1 (b) 3 (c) 2 (d) 4

17. If $\sin \theta = \cos \theta$, then the value of θ is
(a) 90° (b) 45° (c) 60° (d) 30°

18. The total surface area of solid opened at the top in given figure is



- (a) $2\pi r(h + r)$ (b) $2\pi rl$
(c) $2\pi(h + l)$ (d) $2\pi r(h - r)$
- Each of the following questions contains two statements i.e., ASSERTION and REASON, and has following four choices. Only one of which is the correct answer.*

19. **ASSERTION (A) :** If $P(E) = 0.45$ then $P(\bar{E}) = 0.55$
REASON (R) : $P(\bar{E}) = 1 - P(E)$.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.
20. **ASSERTION (A) :** If $a_7 - a_{11} = 300$, then $d = -75$.
REASON (R) : n^{th} term of an A.P. $= a + (n - 1)d$, where a , d and n are first term, common difference and number of terms respectively.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

SECTION B

(Very Short Answers)

This section comprises of VSA of 2 marks each.

21. What type of straight lines will be represented by the system of equations $2x + 3y = 5$ and $4x + 6y = 7$?
22. A vertical stick 12 m long casts a shadow 8 m long on the ground. At the same time a tower casts the shadow 40 m long on the ground. Find the height of the tower.

23. A solid right circular cone of diameter 14 cm and height 8 cm. Find the curved surface area of cone.
24. (a) If the points $A(4, 3)$ and $B(x, 5)$ are on the circle with centre $O(2, 3)$, then find the value of x .

OR

- (b) Find the coordinate of the point which divides the line segment joining the points $(-4, 6)$ and $(3, -8)$ in the ratio $3 : 2$ internally.
25. (a) If $\sin \theta = a/b$, then find the values of $\tan \theta$ and $\sec \theta$.

OR

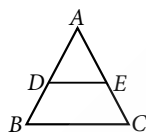
- (b) If $\cot \theta = \frac{8}{15}$, then evaluate $\frac{\sin^2 \theta - \cos^2 \theta}{2 \sin \theta \cos \theta}$.

SECTION C

(Short Answers)

This section comprises of SA type questions of 3 marks each.

26. If the point on x -axis which is equidistant from the points $(2, -5)$ and $(-2, 9)$ is (p, q) , then find the distance of the point (p, q) from origin.
27. In the given figure, $DE \parallel BC$, $AD = 2$ cm, $BD = 2.5$ cm, $AE = 3.2$ cm and $DE = 4$ cm. Find AC and BC .



28. (a) Find acute angle A and B , if $\sin(A + 2B) = \frac{\sqrt{3}}{2}$ and $\cos(A + 4B) = 0$, $A > B$.

OR

- (b) Prove the following identity :

$$\frac{1}{\operatorname{cosec} \theta - \cot \theta} - \frac{1}{\sin \theta} = \frac{1}{\sin \theta} - \frac{1}{\operatorname{cosec} \theta + \cot \theta}$$

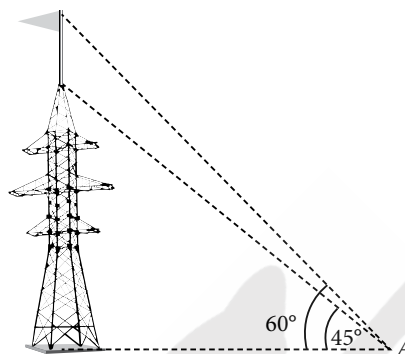
29. If one zero of the polynomial $2x^2 + 3x - k$ is $1/2$, then find the sum of k and the other zero.
30. (a) Seven years ago, Varun's age was five times the square of Swati's age. Three years hence, Swati's age will be two fifth of Varun's age. Find their present ages.

OR

- (b) Solve for x : $\frac{x+4}{x-4} + \frac{x-4}{x+4} = \frac{10}{3}$

31. A pole 5 m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point A on the ground is 60° and

the angle of depression of point A from the top of the tower is 45° . Find the height of the tower. (Take $\sqrt{3} = 1.732$)



SECTION D

(Long Answers)

This section comprises of LA type questions of 5 marks each.

32. A , B and C start cycling around a circular path in the same direction and at the same time. Circumference of the path is 1980 m. If the speed of A is 330 m/min, speed of B is 198 m/min and C is 220 m/min and they start from the same point, then after how much time will they meet again?
33. (a) If the ratio of the sum of the first n terms of two A.P.'s is $(7n + 1) : (4n + 27)$, then find the ratio of their 9^{th} terms.

OR

- (b) In a class the teacher called out four students Sara, Lara, Maira and Laira. She asked Sara, Lara and Maira to write the expression for the sum of n , $2n$ and $3n$ terms of a A.P. as S_1 , S_2 and S_3 respectively. Finally she asked Laira to check whether the relation $S_3 = 3(S_2 - S_1)$ holds true for the expressions given by Sara, Lara and Maira.
34. (a) Two circles touch externally. The sum of their areas is 130π sq. cm and the distance between their centres is 14 cm. Find the radii of the circles.
- OR
- (b) A path of 5 m width runs round a semi-circular grassy plot whose circumference is $163\frac{3}{7}$ m. Find
- the area of the path
 - the cost of gravelling the path at the rate of ₹ 12 per sq. m.
 - the cost of turfing the plot at the rate of 45 paise per m^2 .

35. The following table shows the daily pocket allowance given to the children of a multistory building. The mean of the pocket allowance is ₹ 18. Find out the missing frequency.

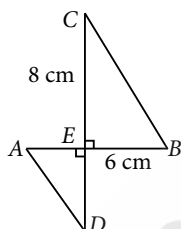
Class interval	Frequency
11-13	3
13-15	6
15-17	9
17-19	13
19-21	?
21-23	5
23-25	4

SECTION E

(Case-study Based Questions)

This section comprises of 3 case-study based questions of 4 marks each with three sub-parts.

36. Manju was making wind charm with old Cd's and some pieces of cardboard. She cut some cardboard pieces as shown below. The ratio of perimeter of $\triangle ADE$ and $\triangle BCE$ is 1 : 2.



Based on the above information answer the following questions.

- (i) If the two triangles here are similar by SAS similarity rule then what is their corresponding proportional sides?

- (ii) Find the length of BC .

- (iii) (a) Find the length of AD .

OR

- (b) Find the length of ED .

37. Three persons toss 3 coins simultaneously and note the outcomes. Then, they ask few questions to one another.



Based on the above information answer the following questions.

- (i) Find the probability of getting atmost one tail.

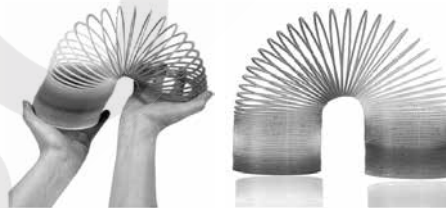
- (ii) Find the probability of getting exactly 1 head.

- (iii) (a) Find the probability of getting exactly 3 tails. Find the probability of getting atmost 3 heads.

OR

- (b) Find the probability of getting atleast two heads.

38. Kaira was playing with a slinky spring and asked her brother Shyam, what is the shape thus formed called. Shyam explained her that the shape formed is a parabola. He also explained her that parabola is the graphical representation of a quadratic polynomial.



Based on the above information answer the following questions.

- (i) Shyam drawn a parabola passing through $(-4, 3)$, $(-1, 0)$, $(1, 8)$, $(0, 3)$, $(-3, 0)$ and $(-2, -1)$ on the graph paper, then what are the zeroes of the polynomial representing the graph?

- (ii) Find the sum of zeros of a quadratic polynomial $ax^2 + bx + c$, $a \neq 0$.

- (iii) (a) Find the of rational roots of the quadratic equation $x^2 - 5x + 6 = 0$, if exist.

OR

- (b) Find the equal roots of the quadratic equation $9x^2 + 6x + 1 = 0$.