

MATHEMATICS STANDARD (041)

PRACTICE QUESTION PAPER

CLASS – X (2026 – 27) | Board Examination 2027

Maximum Marks: 80

Time Allowed: 3 hours

General Instructions:

Read the following instructions very carefully and strictly follow them:

- (i) This question paper contains 38 questions. All questions are compulsory.
- (ii) This question paper is divided into five Sections – A, B, C, D and E.
- (iii) In Section A, questions number 1 to 18 are Multiple Choice Questions (MCQs) and questions number 19 and 20 are Assertion–Reason based questions of 1 mark each.
- (iv) In Section B, questions number 21 to 25 are Very Short Answer (VSA) type questions carrying 2 marks each.
- (v) In Section C, questions number 26 to 31 are Short Answer (SA) type questions carrying 3 marks each.
- (vi) In Section D, questions number 32 to 35 are Long Answer (LA) type questions carrying 5 marks each.
- (vii) In Section E, questions number 36 to 38 are case study based questions carrying 4 marks each.
- (viii) There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C and 2 questions in Section D. An internal choice has been provided in the 2-mark sub-parts of questions in Section E.
- (ix) Draw neat and clean figures wherever required. Take $\pi = 22/7$ wherever required, if not stated.
- (x) Use of calculators is not allowed.

SECTION – A (20 × 1 = 20)		
This section comprises 18 multiple choice questions and two assertion–reason questions of 1 mark each.		
1.	The greatest number that divides 245 and 1029, leaving remainder 5 in each case, is: (A) 8 (B) 16 (C) 32 (D) 48	1
2.	The 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) $x^2 + x + 12$	1
3.	The pair of linear equations $x + 2y = 5$ and $3x + ky = 20$ has no solution when k is: (A) 2 (B) 3 (C) 6 (D) 9	1
4.	The quadratic equation $2x^2 - 4x + k = 0$ has two equal real roots. The value of k is: (A) 1 (B) 4 (C) 8 (D) 2	1
5.	The mean and the median of a distribution are 26 and 25 respectively. Its mode is: (A) 23 (B) 24 (C) 27 (D) 28	1
6.	$\triangle ABC \sim \triangle DEF$ and $ar(\triangle ABC) : ar(\triangle DEF) = 9 : 25$. If the perimeter of $\triangle ABC$ is 18 cm, then the perimeter of $\triangle DEF$ is: (A) 20 cm (B) 25 cm (C) 40 cm (D) 30 cm	1
7.	The point on the x-axis which is equidistant from the points (3, 2) and (–5, –2) is: (A) (1, 0) (B) (0, 1) (C) (–1, 0) (D) (0, –1)	1
8.	If $\sin \theta = 3/5$, where θ is an acute angle, then the value of $\sec \theta + \tan \theta$ is: (A) 1/2 (B) 2 (C) 3/2 (D) 5/2	1

9.	A card is drawn at random from a well-shuffled pack of 52 cards. The probability that it is neither a king nor a red card is: (A) $\frac{7}{13}$ (B) $\frac{6}{13}$ (C) $\frac{5}{13}$ (D) $\frac{4}{13}$	1
10.	The diameter of a wheel is 56 cm. The distance covered by it in 100 complete revolutions is: (A) 17.6 m (B) 88 m (C) 352 m (D) 176 m	1
11.	The total surface area of a solid hemisphere of radius 7 cm is: (A) 462 cm^2 (B) 308 cm^2 (C) 154 cm^2 (D) 616 cm^2	1
12.	The mean of x , $x + 2$, $x + 4$, $x + 6$ and $x + 8$ is 11. The value of x is: (A) 5 (B) 6 (C) 7 (D) 8	1
13.	A die is thrown once. The probability of getting a prime number or a multiple of 3 is: (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{2}{3}$ (D) $\frac{5}{6}$	1
14.	The point $P(k, 0)$ divides the line segment joining $A(2, -2)$ and $B(-7, 4)$ in the ratio 1 : 2. The value of k is: (A) 1 (B) -1 (C) 2 (D) -2	1
15.	From an external point Q , the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is: (A) 7 cm (B) 12 cm (C) 15 cm (D) 24.5 cm	1
16.	The perimeter of a circle is equal to the perimeter of a square of side 22 cm. The radius of the circle is: (A) 7 cm (B) 21 cm (C) 28 cm (D) 14 cm	1
17.	A ladder 10 m long reaches a window $5\sqrt{3}$ m above the ground. The angle made by the ladder with the ground is: (A) 30° (B) 45° (C) 60° (D) 90°	1
18.	A bag contains 4 red balls and some blue balls. If the probability of drawing a blue ball is twice that of drawing a red ball, then the number of blue balls is: (A) 4 (B) 6 (C) 8 (D) 12	1
Directions: Questions number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer from the options (A), (B), (C) and (D) as given below: (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.		
19.	Assertion (A): The point which divides the line segment joining (1, 2) and (4, 5) internally in the ratio 1 : 2 is (2, 3). Reason (R): The point dividing the line segment joining (x_1, y_1) and (x_2, y_2) internally in the ratio $m : n$ is $\left(\frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n}\right)$.	1
20.	Assertion (A): If PA and PB are two tangents drawn from an external point P to a circle with centre O , and $\angle APB = 70^\circ$, then $\angle AOB = 110^\circ$. Reason (R): The tangent at any point of a circle is parallel to the radius through the point of contact.	1

SECTION – B ($5 \times 2 = 10$)		
<i>This section comprises 5 Very Short Answer (VSA) type questions of 2 marks each.</i>		
21(A).	Find the HCF and LCM of 120 and 144 using prime factorisation.	2
OR		
21(B).	Find the smallest number which, when divided by 12, 15 and 20, leaves a remainder of 5 in each case.	
22(A).	Find the value of k for which the pair of linear equations $2x + 3y = 7$ and $(k - 1)x + (k + 2)y = 3k$ has infinitely many solutions.	2
OR		
22(B).	Solve the pair of equations $2x + 3y = 11$ and $2x - 4y = -24$, and hence find the value of m for which $y = mx + 3$.	
23.	Evaluate: $(5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ) / (\sin^2 30^\circ + \cos^2 30^\circ)$	2
24.	The minute hand of a clock is 21 cm long. Find the area swept by the minute hand in 10 minutes. (Use $\pi = 22/7$)	2
25.	A bag contains 5 red, 8 white, 4 green and 3 black balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is: (i) not red (ii) either white or green.	2

SECTION – C ($6 \times 3 = 18$)		
<i>This section comprises 6 Short Answer (SA) type questions of 3 marks each.</i>		
26.	Given that $\sqrt{5}$ is an irrational number, prove that $(3 + 2\sqrt{5})$ is an irrational number.	3
27.	If α and β are the zeroes of the quadratic polynomial $3x^2 - 5x - 2$, find the value of $(1/\alpha + 1/\beta - 2\alpha\beta)$.	3
28(A).	The sum of the first n terms of an AP is $3n^2 + 5n$. Find the AP and its 20th term.	3
OR		
28(B).	Find the sum of all three-digit natural numbers which are multiples of 7.	
29.	Prove that the lengths of tangents drawn from an external point to a circle are equal.	3
30.	In what ratio does the y-axis divide the line segment joining the points A(5, -6) and B(-1, -4)? Also, find the coordinates of the point of division.	3
31(A).	Prove that: $(\sin \theta - 2\sin^3 \theta) / (2\cos^3 \theta - \cos \theta) = \tan \theta$	3
OR		
31(B).	Prove that: $(\operatorname{cosec} \theta - \cot \theta)^2 = (1 - \cos \theta) / (1 + \cos \theta)$	

SECTION – D ($4 \times 5 = 20$)		
<i>This section comprises 4 Long Answer (LA) type questions of 5 marks each.</i>		
32.	A motorboat whose speed in still water is 18 km/h takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.	5

33.	Prove that a line drawn parallel to one side of a triangle to intersect the other two sides in distinct points divides the other two sides in the same ratio. Using the above theorem, solve the following: In $\triangle ABC$, $DE \parallel BC$ where D lies on AB and E lies on AC. If $AD = x$, $DB = x - 2$, $AE = x + 2$ and $EC = x - 1$, find the value of x.	5
34(A).	A toy is in the form of a cone surmounted on a hemisphere. The radius of the hemisphere (and of the base of the cone) is 7 cm and the height of the cone is 24 cm. Find the total surface area of the toy. Also find the cost of painting the whole toy at the rate of ₹ 2 per cm^2 . (Use $\pi = 22/7$)	5
OR		
34(B).	A hemispherical depression is cut out from one face of a cubical wooden block of edge 21 cm, such that the diameter of the hemisphere is equal to the edge of the cube. Find the total surface area of the remaining solid. (Use $\pi = 22/7$)	
35(A).	From the top of a 60 m high building, the angles of depression of the top and the bottom of a tower are observed to be 30° and 60° respectively. Find the height of the tower and its horizontal distance from the building.	5
OR		
35(B).	From a point on the ground, the angle of elevation of the top of a tower is 30° . On walking 60 m towards the tower, the angle of elevation becomes 60° . Find the height of the tower. (Use $\sqrt{3} = 1.73$)	

SECTION – E ($3 \times 4 = 12$)		
<i>This section comprises 3 case study based questions of 4 marks each, with sub-parts (i), (ii), (iii) of 1, 1 and 2 marks respectively.</i>		
36.	An auditorium has 15 rows of seats. The first row has 20 seats and each subsequent row has 3 more seats than the row before it. <i>Based on the above information, answer the following questions:</i> (i) What is the common difference of the AP formed by the number of seats in the rows? (ii) How many seats are there in the 10th row? (iii) (A) Find the total number of seats in the auditorium. OR (iii) (B) Which row of the auditorium has 59 seats?	1 1 2
37.	A circular ground has centre O and radius 7 m. A pole is fixed at a point P outside the ground such that $OP = 25$ m. Two straight ropes PA and PB are tied from the pole to points A and B on the boundary of the ground, so that PA and PB are tangents to the circle. <i>Based on the above information, answer the following questions:</i> (i) What is the measure of $\angle OAP$? (ii) Find the length of the rope PA. (iii) (A) Find the area of the quadrilateral OAPB. OR (iii) (B) Find the length of the chord AB.	1 1 2

38.

A coaching centre recorded the number of practice problems solved in a week by 50 Class X students preparing for the pre-board examination. The grouped frequency distribution is given below:

Problems solved	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Number of students	4	8	14	16	8

Based on the above information, answer the following questions:

(i) Identify the modal class.

(ii) Find the class interval containing the median.

(iii) (A) Find the mean number of problems solved by a student.

OR

(iii) (B) Find the mode of the data.

1
1
2

— End of Question Paper —