

MATHEMATICS — STANDARD (Subject Code 041)**Class X (2026-27) · PRACTICE QUESTION PAPER — SET 1****Time Allowed:** 3 Hours**Maximum Marks:** 80**General Instructions:**

- (1) This question paper contains **38 questions**. All questions are compulsory.
- (2) The paper is divided into **5 Sections — A, B, C, D and E**.
- (3) Section A: Q1–18 are multiple choice questions and Q19–20 are assertion-reason questions, of **1 mark** each.
- (4) Section B: Q21–25 are very short answer questions of **2 marks** each.
- (5) Section C: Q26–31 are short answer questions of **3 marks** each.
- (6) Section D: Q32–35 are long answer questions of **5 marks** each.
- (7) Section E: Q36–38 are case-study based questions of **4 marks** each, with sub-parts of 1, 1 and 2 marks.
- (8) There is no overall choice. An internal choice is provided in 2 questions of Section B, 2 of Section C, 2 of Section D, and in the 2-mark sub-part of every question of Section E.
- (9) Draw neat figures wherever required. Take $\pi = 22/7$ unless stated otherwise.
- (10) Use of a calculator is **not** allowed.

SECTION A

Q1 to Q20 carry 1 mark each. Q1–Q18 are multiple choice questions; Q19–Q20 are assertion-reason questions. — 20 marks

1. Two positive integers are $2^3 \times 3^2 \times 5$ and $2^2 \times 3^3 \times 7$. Their HCF is: **[1]**
 - (A) $2^2 \times 3^2$
 - (B) $2^3 \times 3^3$
 - (C) $2^2 \times 3^2 \times 5$
 - (D) $2^3 \times 3^3 \times 5 \times 7$
2. If $\text{HCF}(a, b) = 12$ and $a \times b = 1728$, then $\text{LCM}(a, b)$ is: **[1]**
 - (A) 144
 - (B) 288
 - (C) 12
 - (D) 1728
3. Which one of the following rational numbers has a terminating decimal expansion? **[1]**
 - (A) $7/45$
 - (B) $9/64$
 - (C) $11/30$
 - (D) $13/42$
4. If 3 is a zero of the polynomial $p(x) = x^2 - 7x + k$, then the value of k is: **[1]**
 - (A) 10
 - (B) 12
 - (C) -12
 - (D) 21
5. The quadratic equation $2x^2 - 4x + 3 = 0$ has: **[1]**
 - (A) two distinct real roots
 - (B) two equal real roots
 - (C) no real roots
 - (D) more than two real roots

6. The pair of linear equations $3x + 2y = 5$ and $6x + 4y = 11$ is: **[1]**
(A) consistent with a unique solution
(B) consistent with infinitely many solutions
(C) inconsistent
(D) consistent with exactly two solutions
7. The 15th term of the AP 7, 11, 15, 19, ... is: **[1]**
(A) 59
(B) 63
(C) 67
(D) 71
8. If the n th term of an AP is given by $a_n = 5 - 3n$, then its common difference is: **[1]**
(A) 5
(B) 3
(C) -3
(D) 2
9. If $M(3, -2)$ is the midpoint of the line segment joining $A(1, 4)$ and $B(x, y)$, then the coordinates of B are: **[1]**
(A) (5, -8)
(B) (2, 1)
(C) (4, 2)
(D) (-1, 10)
10. In triangles ABC and DEF, $\angle A = \angle D$ and $\angle B = \angle E$. If $AB = 4$ cm, $DE = 6$ cm and $BC = 6$ cm, then EF is: **[1]**
(A) 4 cm
(B) 8 cm
(C) 9 cm
(D) 12 cm
11. In $\triangle ABC$ and $\triangle DEF$ it is given that $AB/DE = BC/EF = CA/FD$. The two triangles are similar by the: **[1]**
(A) AA criterion
(B) SAS criterion
(C) SSS criterion
(D) RHS criterion
12. The tangents drawn at the two end points of a diameter of a circle are: **[1]**
(A) perpendicular to each other
(B) parallel to each other
(C) intersecting at the centre
(D) inclined to each other at 60°
13. In $\triangle ABC$, D lies on AB and E lies on AC with $DE \parallel BC$. If $AD = 3$ cm, $DB = 5$ cm and $AE = 4.5$ cm, then AC is: **[1]**
(A) 7.5 cm
(B) 9 cm
(C) 12 cm
(D) 13.5 cm
14. If $\sin \theta = 3/5$, where θ is acute, then $\tan \theta$ is: **[1]**
(A) $3/4$
(B) $4/3$
(C) $4/5$
(D) $5/3$

15. The value of $(\tan 25^\circ)/(\cot 65^\circ)$ is: **[1]**

- (A) 0
- (B) $1/2$
- (C) 1
- (D) 2

16. A circular sheet of radius 10.5 cm is cut into 6 identical sectors. The area of each sector is (take $\pi = 22/7$): **[1]**

- (A) 57.75 cm^2
- (B) 115.5 cm^2
- (C) 173.25 cm^2
- (D) 346.5 cm^2

17. A solid is formed by mounting a hemisphere of radius 7 cm on one flat end of a right circular cylinder of the same radius and height 10 cm. The curved surface area of the solid, excluding its flat circular base, is (take $\pi = 22/7$): **[1]**

- (A) 440 cm^2
- (B) 594 cm^2
- (C) 748 cm^2
- (D) 902 cm^2

18. A bag contains 5 red, 4 green and 6 blue balls. One ball is drawn at random. The probability that it is **not** blue is: **[1]**

- (A) $2/5$
- (B) $3/5$
- (C) $1/3$
- (D) $4/15$

19. Assertion (A): If the probability of an event happening is 0.35, then the probability of the event not happening is 0.65. **[1]**

Reason (R): For any event E, $P(E) + P(\text{not } E) = 1$.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

20. Assertion (A): If two triangles are similar, then their corresponding sides are always equal in length. **[1]**

Reason (R): In two similar triangles the corresponding angles are equal and the corresponding sides are in the same ratio.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

SECTION B

Q21 to Q25 are very short answer questions carrying 2 marks each. — 10 marks

21. Find the value of k for which the quadratic equation $kx^2 - 6x + 2 = 0$ has two equal real roots. **[2]**

22. The point P divides the line segment joining A(-2, 3) and B(6, -5) internally in the ratio 3 : 1. Find the coordinates of P. **[2]**

OR

Find the value of a for which the point P(a, 3) is equidistant from A(4, -1) and B(-2, 5).

23. In $\triangle ABC$, the point D lies on AB and the point E lies on AC. Given $AD = 3 \text{ cm}$, $DB = 4.5 \text{ cm}$, $AE = 4 \text{ cm}$ and $EC = 6 \text{ cm}$, show that DE is parallel to BC. **[2]**

24. If $5 \tan \theta = 12$, find the value of $(5 \sin \theta - 3 \cos \theta)/(5 \sin \theta + 3 \cos \theta)$. [2]

OR

If $\tan \theta + \cot \theta = 3$, find the value of $\tan^2 \theta + \cot^2 \theta$.

25. In a school quiz, the next question will be answered by exactly one of three students — Aarav, Bela or Chetan. The probability that Aarav answers it is 0.4 and the probability that Bela answers it is 0.35. Find (a) the probability that Chetan answers it, (b) the probability that it is not answered by Aarav. [2]

SECTION C

Q26 to Q31 are short answer questions carrying 3 marks each. — 18 marks

26. A stationery shop has 168 pencils and 120 erasers. The owner wants to make identical gift packs using all of them, so that every pack has the same number of pencils and the same number of erasers, with nothing left over. [3]

- (a) Write 168 and 120 as products of their prime factors.
- (b) Find the greatest number of such gift packs that can be made.
- (c) How many pencils and how many erasers will each of those packs contain?

27. The points $A(-3, 7)$ and $B(5, -1)$ are the ends of a line segment. [3]

- (a) Find the coordinates of the midpoint of AB.
- (b) Find the length of AB.
- (c) Find the coordinates of the point P which divides AB internally in the ratio 3 : 1.

OR

The points $A(1, 2)$, $B(4, 6)$ and $C(x, 10)$ are such that $AB = BC$. Find the possible values of x , and state the length of AB.

28. A circle with centre O has radius 9 cm. From an external point T, two tangents TA and TB are drawn, touching the circle at A and B. The distance OT is 15 cm. [3]

- (a) Explain why $\angle OAT$ and $\angle OBT$ are both right angles.
- (b) Find the length of each tangent.
- (c) Find the perimeter of the quadrilateral OATB.

29. If $\sec \theta + \tan \theta = 5/3$, find the value of $\sin \theta$. [3]

30. A circular flower bed of radius 42 m has a path marked along a sector of central angle 30° . Taking $\pi = 22/7$, find (a) the area of this sector and (b) its perimeter. [3]

OR

A solid is in the shape of a right circular cone of radius 7 cm and height 24 cm, mounted on a right circular cylinder of the same radius and height 10 cm. Find (a) the slant height of the cone and (b) the total volume of the solid. (Take $\pi = 22/7$)

31. A bag contains 8 red, 6 white and 10 black marbles, all of the same size. One marble is drawn at random. Find the probability that the marble drawn is [3]

- (a) black, (b) not white, (c) either red or white.

SECTION D

Q32 to Q35 are long answer questions carrying 5 marks each. — 20 marks

32. A rectangular sheet of card has a perimeter of 44 cm. A square of side 2 cm is cut away from each of its four corners, and the four flaps that remain are folded up to form an open box of height 2 cm. The base of the box has an area of 45 cm^2 . Find the length and the breadth of the original sheet of card. [5]

33. (a) Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio. (3) [5]

- (b) In $\triangle ABC$, D lies on AB and E lies on AC with $DE \parallel BC$. If $AD = 4 \text{ cm}$, $DB = 6 \text{ cm}$ and $AC = 15 \text{ cm}$, find AE. (2)

OR

- (a) Prove that the lengths of the two tangents drawn from an external point to a circle are equal. **(3)**
(b) Two tangents are drawn from an external point P to a circle with centre O and radius 8 cm. If each tangent is 15 cm long, find the distance OP. **(2)**

34. A lighthouse stands 60 m above sea level. From its top, the angles of depression of two boats floating on the same side of the lighthouse and in line with its foot are 60° and 30° . **[5]**

Find (a) the distance of the nearer boat from the foot of the lighthouse, and (b) the distance between the two boats. (Take $\sqrt{3} = 1.73$)

35. A solid is in the form of a right circular cone mounted on a hemisphere of the same radius. The radius is 21 cm and the height of the cone is 72 cm. Taking $\pi = 22/7$, find **[5]**

(a) the slant height of the cone, (b) the total surface area of the solid, and (c) the volume of the solid.

OR

A grain silo is in the shape of a right circular cylinder of radius 21 m and height 30 m, closed at the top by a hemispherical dome of the same radius. Taking $\pi = 22/7$, find

(a) the total volume of the silo, and (b) the total curved surface area to be painted (the curved wall of the cylinder together with the dome).

SECTION E

Q36 to Q38 are case-study based questions carrying 4 marks each, with sub-parts of 1, 1 and 2 marks. An internal choice is provided in the 2-mark sub-part. — 12 marks

36. Read the following and answer the questions that follow. **[4]**

A newly built stadium has 20 rows of seats. The first row has 24 seats, the second row has 28 seats, the third row has 32 seats, and so on — each row has 4 more seats than the row immediately in front of it.

- (a) Write the common difference of the arithmetic progression formed by the number of seats in the rows. **(1)**
(b) How many seats are there in the 10th row? **(1)**
(c) Find the total number of seats in the stadium. **(2)**

OR

(c) Which row of the stadium has exactly 76 seats? **(2)**

37. Read the following and answer the questions that follow. **[4]**

At a school fete, a stall sold identical handmade gift boxes. The number of boxes sold that day turned out to be 5 less than the price of one box in rupees, and the stall collected ₹336 in all.

- (a) If the price of one box is ₹x, write an expression for the number of boxes sold. **(1)**
(b) Form the quadratic equation that represents this situation. **(1)**
(c) Find the price of one box and the number of boxes sold. **(2)**

OR

(c) The stall had 4 more boxes left unsold. How much more money would it have collected had those been sold at the same price? **(2)**

38. Read the following and answer the questions that follow. **[4]**

A class teacher recorded the daily pocket money, in rupees, of the 40 students of her class. The grouped frequency distribution is shown below.

Pocket money (₹)	0-20	20-40	40-60	60-80	80-100
Number of students	6	9	13	8	4

- (a) Write the modal class of the distribution. **(1)**
(b) Find the class mark of the class 60-80. **(1)**
(c) Find the mean daily pocket money of the students. **(2)**

OR

(c) Find the median class of the distribution, and state the cumulative frequency of the class just before it. **(2)**

— End of paper —

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