TECHNO INDIA GROUP PUBLIC SCHOOL

Mock Paper-3
Mathematics
Standard (Code No. 41)
Class—X (2025–26)

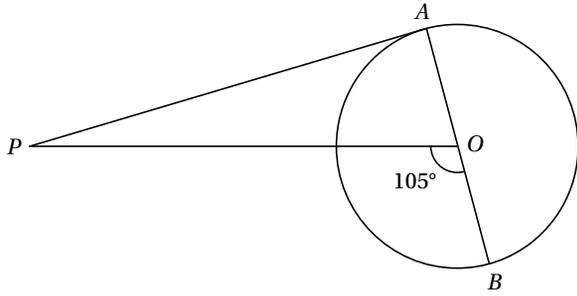Time Allowed: **3 hours** Maximum Marks: **80**

General Instructions:

Read the following instructions carefully and 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 questions 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 question of Section E.

9. Draw neat and clean figures wherever required. Take $\pi = \dfrac{22}{7}$ wherever required if not stated.

10. Use of calculators is not allowed.

SECTION A

Section A: consists of 20 questions of 1 mark each.

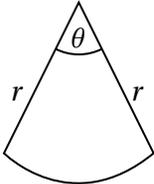|		
1.	The graph of quadratic polynomial $p(x) = x^2 - 16$ passes through the point	[1]
	Ⓐ (2,0) Ⓑ (−2,0) Ⓒ (4,0) Ⓓ (0,−4)	
2.	Graphically, the pair of equations $6x - 3y + 10 = 0$ and $2x - y + 9 = 0$ represents two lines which are	[1]
	Ⓐ intersecting at exactly one point Ⓑ intersecting at exactly two points Ⓒ coincident Ⓓ parallel	
3.	Which of the following statements is not true?	[1]
	Ⓐ Through three non collinear points one and only circle can be drawn. Ⓑ Only one tangent can be drawn at a point on a circle. Ⓒ Infinitely many tangent can be drawn on a circle. Ⓓ Two concentric circles intersect each other at two different point.	
4.	If S_n of an A.P. is $7n^2 - 4n$, then the common difference of the A.P. is	[1]
	Ⓐ 14 Ⓑ 7 Ⓒ 8 Ⓓ −8	
5.	Two identical spheres are placed inside a cylinder in such a way that they touch each other and fit perfectly within the cylinder. Find the ratio of the volume of one sphere to the volume of the cylinder. Ⓐ 3 : 1 Ⓑ 1 : 3 Ⓒ 2 : 1 Ⓓ 1 : 2	[1]
6.	If $4\cot\theta - 5 = 0$, then the value of $\dfrac{5\sin\theta - 4\cos\theta}{5\sin\theta + 4\cos\theta}$ Ⓐ $\dfrac{5}{3}$ Ⓑ $\dfrac{5}{6}$ Ⓒ 0 Ⓓ $\dfrac{1}{6}$	[1]
7.	In the given figure, PA is a tangent from an external point P to a circle with centre O. If $\angle POB = 105°$, then the value of $\angle APO$ is Ⓐ 105° Ⓑ 75° Ⓒ 15° Ⓓ 60°	[1]
8.	A quadratic polynomial having zeroes $-\dfrac{1}{\sqrt{2}}$ and $\dfrac{1}{\sqrt{2}}$ is Ⓐ $2x^2 + 1$ Ⓑ $2x^2 - 1$ Ⓒ $x^2 + 2$ Ⓓ $x^2 - 2$	[1]

9.	Consider the frequency distribution of 45 observations.	[1]

Class   0–10   10–20   20–30   30–40   40–50

Frequency   5   9   15   10   6

The lower limit of median class is

  Ⓐ   20   Ⓑ   10   Ⓒ   30   Ⓓ   40

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10. In the given figure, *PT* is a tangent to a circle with centre *O*, at point *R*. If diameter *SQ* is produced, it meets with *PT* at point *P* with $\angle SPR = x$ and $\angle QSR = y$, then the value of $x + 2y$ is   [1]

  Ⓐ   60°   Ⓑ   30°   Ⓒ   0°   Ⓓ   90°

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11. The roots of the quadratic equation $x^2 + x - 4 = 0$ are   [1]

  Ⓐ   Irrational and distinct   Ⓑ   not real

  Ⓒ   rational and distinct   Ⓓ   real and equal

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12. If $\sin\theta = \cos\theta$, then the value of θ is   [1]

  Ⓐ   0°   Ⓑ   30°   Ⓒ   45°   Ⓓ   90°

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13. If a semicircle with radius $OA = 3$ cm is rotated about *OA*, it forms a hemisphere. Calculate the volume of the hemisphere.   [1]

  Ⓐ $28\,\pi\,\text{cm}^3$ Ⓑ $27\,\pi\,\text{cm}^3$

  Ⓒ $18\,\pi\,\text{cm}^3$ Ⓓ   none of these

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14. The sum of probabilities of all the elementary events of an experiment is   [1]

  Ⓐ   0   Ⓑ   1   Ⓒ   1.5   Ⓓ   none of these

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15. The number of points that are exactly 1 unit away from the origin is   [1]

  Ⓐ 10^{10} Ⓑ 10^{100} Ⓒ 10^{1000} Ⓓ   none of these

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16. Which of the following represents the most frequent observation in the data?   [1]

  Ⓐ   Median   Ⓑ   Mean   Ⓒ   Range   Ⓓ   Mode

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17. Find the coordinates of the mid point of the line segment joining the points $A(\sin^2\theta, \sec^2\theta)$ and $B(\cos^2\theta, -\tan^2\theta)$ where θ is an acute angle   [1]

  Ⓐ $\left(\dfrac{1}{2}, 0\right)$ Ⓑ $\left(0, -\dfrac{1}{2}\right)$ Ⓒ $\left(\dfrac{1}{2}, \dfrac{1}{2}\right)$ Ⓓ $\left(-\dfrac{1}{2}, -\dfrac{1}{2}\right)$

| 18. | A card is drawn from a well shuffled deck of playing cards. The probability of getting black honour is

Ⓐ $\dfrac{2}{13}$ Ⓑ $\dfrac{1}{2}$ Ⓒ $\dfrac{3}{52}$ Ⓓ $\dfrac{3}{26}$ | [1] |

■ **Assertion-Reason Based Questions (19–20)**

In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choice the correct answer out of the following choices.

(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.
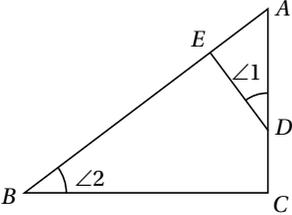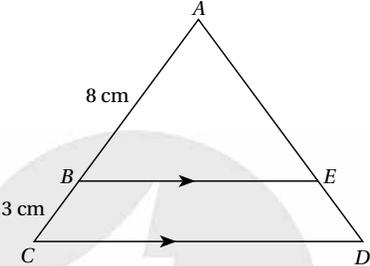
(D) Assertion (A) is false but Reason (R) is true.

| 19. | Assertion (A): HCF (0, 4) = 4
Reason (R): If HCF $(a, b) = d$, then d is the greatest positive integer which divides both a and b.

Ⓐ (A)   Ⓑ (B)   Ⓒ (C)   Ⓓ (D) | [1] |
| 20. | Assertion (A): If the area of a sector and its perimeter are numerically equal, then the radius is 1 unit.
Reason (R): $ar\,(\text{sector}) = \dfrac{\theta}{360°} \times \pi r^2$

$\text{Perimeter (sector)} = \dfrac{\theta}{360°} \times 2\pi r$

Ⓐ (A)   Ⓑ (B)   Ⓒ (C)   Ⓓ (D) | [1] |

SECTION B

Section B consists of 5 questions of 2 marks each.

| 21. | (A) If HCF of two numbers is 21 and their product is 1407, find their LCM.
<div align="center">OR</div>(B) Find the HCF and LCM of 96 and 404 by prime factorization method. | [2]
[2] |
22.	(A) Two dice are rolled together bearing numbers 0, 6, 7, 9, 4, 11. Find the probability that the product of numbers obtained is minimum. OR (B) A bag contains 20 balls out of which x balls are white. If one ball is drawn at random, the probability of drawing a white ball is y. Now, if 10 more white balls are added in the bag and one ball is drawn from the bag, the probability of drawing a white ball is $2y$. Find x.	[2] [2]
23.	Find the value of $4\sin^2 30° \tan 60° - 3\cos^2 60° + 1$	[2]
24.	$ABCD$ is a quadrilateral with $A(6,0)$, $B(0,4)$, $C(-6,0)$ and $D(0,-4)$. Calculate the length of AB and mid-point of CD.	[2]
25.	Find a relation between x and y, such that the point (x,y) is equidistant from the points $(3,6)$ and $(-3,4)$.	[2]

SECTION C

Section C consists of 6 questions of 3 marks each

26.	(A) In $\triangle ABC$, if $\angle ADE = \angle B$, then prove that $\triangle ADE \sim \triangle ABC$. Also, if $AD = 7.6$ cm, $AE = 7.2$ cm, $BE = 4.2$ cm and $BC = 8.4$ cm then find DE. OR (B) In the given figure, $AB = 8$ cm, $BC = 3$ cm and $BE \parallel CD$. Find (a) $\dfrac{BE}{CD}$ (b) $\dfrac{\text{Perimeter of } \triangle ABE}{\text{Perimeter of } \triangle ACD}$	[3]
27.	The sum of two numbers is 8 and the sum of their reciprocals is $\dfrac{8}{15}$. Find the numbers.	[3]
28.	If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 + x - 2$, then find the polynomial whose zeroes are $2\alpha + 1$ and $2\beta + 1$.	[3]
29.	If $a\cos\theta + b\sin\theta = c$, then prove that $a\sin\theta - b\cos\theta = \pm\sqrt{a^2 + b^2 + c^2}$.	[3]
30.	(A) The length of the minute hand of a clock is 14 cm. Find the area swept out by the minute hand in 1 hour. (B) A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment. (take, $\pi = 3.14$)	[3] [3]
31.	Prove that $\left(8\sqrt{3} + 1\right)$ is an irrational number.	[3]

SECTION D

Section D consists of 4 questions of 5 marks each

32.	(A) Solve the following equation graphically: $\left(x + 2y - 3\right)^2 + \left(2x - 3y + 8\right)^2 = 0$ OR (B) If the price of a dozen pins is reduced by 2 paise, you can get 6 more pins for 42 paise. What is the current price of a dozen pins?	[5] [5]

33.	What is value of the angle formed by radius and tangent at the point of contact to a circle?	[5]
	AB is a chord of length 9.6 cm of a circle with centre O and radius 6 cm. The tangents at A and B intersects at P. Find the length of PA.	
34.	At a certain point the angle of elevation of a tower is found to be such that its contangent is $\frac{3}{5}$; on walking 32 m directly toward the tower its angle of elevation is an angle whose contangent is $\frac{1}{3}$. Find the height of the tower.	[5]
35.	(A) Find the mean and median of the following data: Class 100–110 110–120 120–130 130–140 140–150 Frequency 4 14 21 8 3 OR (B) Find the mode of the following data: Class 0–10 10–20 20–30 30–40 40–50 50–60 Frequency 4 6 7 12 5 6	[5] [5]

SECTION E

Section E consists of 3 case study based questions of 4 marks each.

36.	Your friend Veer wants to participate in 200 m race. He currently runs this distance in 51 seconds and with each day of practice it takes him 2 seconds less in every day. He wants to do it in 31 seconds.	[4]
	On the basis of the above situation answer the following questions.	
	(i) Express the situation in AP.	[2]
	(ii) Find the minimum number of days he needs to achieve his goal.	[2]
	(iii) (A) What was his initial speed?	[1]
	OR	
	(B) What will be his final speed?	[1]

37.	A group of students as volunteer are working in making a safety board for school. They prepared on triangular safety board for their school with title 'School Ahead' and 'Drive Slow' in two parts of the triangular board shown in below figure. Where, *DE ‖ BC*.	[4]
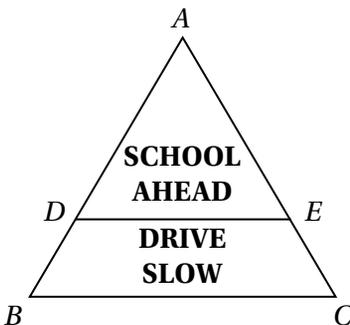
Based on the above information, answer the following questions.

(i) (A) If *AD* = 2 cm, *BD* = 5 cm and *AE* = 3 cm, then find *EC*.   [2]

OR

    (B) If *AD* = 3 cm, *AB* = 9 cm, *BC* = 6 cm, then evaluate *DE*.   [2]

(ii) Show that $\triangle ADE \sim \triangle ABC$.   [1]

(iii) If $\angle A = 60°$ and $\angle ADE = 50°$, then find $\angle C$.   [1]

38.	A mathematics teacher took her grade X students to the Taj Mahal. It was an educational trip. She was interested in history also. On reaching there she told them about the seventh wonder. She also told them that the structure of the monument is a combination of several Solid figures. There are 4 pillars that are cylindrical in shape. A big dome in the centre and 2 more small domes on both sides of the big dome on its side. The domes are hemispherical. The pillars also have domes on them.

On the basis of this answer the following questions.

(i) How much cloth material will be required to cover the big dome of diameter 7 m?   [1]

(ii) Find the volume of a pillar with height *h* and dome radius *r*.   [1]

(iii) (A) How much is the volume of the hemisphere if the radius of the base is 3 m?   [2]

OR

    (B) Find the CSA of 4 pillars if the height of the pillars is 7.5 m and radius of the base is 2.5 m?   [2]