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MATHEMATICS

(STANDARD & BASIC)

SURE SHOT QUESTIONS

FOR 2026 BOARD EXAMS

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SACHIN PANDEY

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- ✦ **16 Solved Sample Papers**
- ✦ **5 Unsolved Sample Papers**
(Solutions access by QR Code)

- Multiple Choice Questions**
- Case Study Questions**
- Assertion-Reason Questions**
- Subjective Type Questions**



For CBSE 2026 Board Exams - Class 10 (Standard & Basic)

MATHEMATICS (UTS-21)



a compilation by

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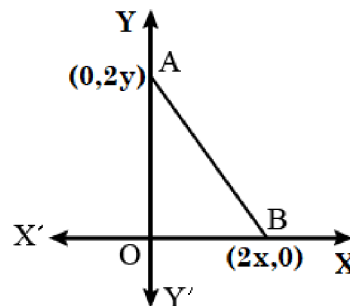
General Instructions : Same as given in UTS-01.

SECTION A

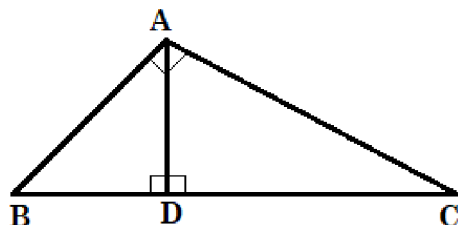
(Question numbers 01 to 20 carry 1 mark each.)

Followings are **multiple choice questions**. Select the correct option in each one of them.

01. The HCF and LCM of 90 and 144 respectively, are
(a) 18 and 720 (b) 9 and 45 (c) 720 and 15 (d) None of these
02. The zeroes of the polynomial $f(x) = 4x^2 + 8x$ are
(a) 2, 0 (b) -2, 2 (c) 0, 1 (d) 0, -2
03. If 3 is one zero of the polynomial $f(x) = 9x^2 - 3(a-1)x + 5$, then the value of a is
(a) $\frac{81}{5}$ (b) $\frac{95}{9}$ (c) $\frac{40}{9}$ (d) None of these
04. The value of k for which the system of linear equations given by $2x + 3y = 7$ and $kx + 9y = 15$ has a unique solution, then value of k is
(a) $k = 6$ (b) $k \neq -6$ (c) $k \neq 6$ (d) None of these
05. The coordinate of the point which is equidistant from the three vertices of $\triangle AOB$ as shown in the figure, is
(a) (x, y) (b) (y, x)
(c) $\left(\frac{x}{2}, \frac{y}{2}\right)$ (d) $\left(\frac{y}{2}, \frac{x}{2}\right)$



06. In the given figure, $\angle BAC = 90^\circ$ and $AD \perp BC$, then

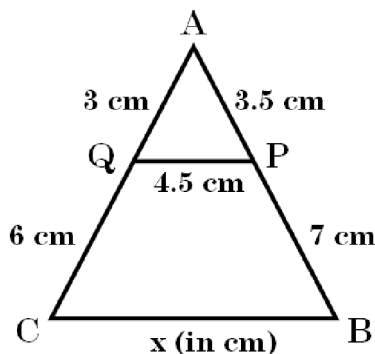


- (a) $BD \cdot CD = BC^2$ (b) $BD \cdot CD = AD^2$
(c) $AB \cdot AC = BC^2$ (d) $AB \cdot AC = AD^2$

07. If $\sin \theta + \sin^2 \theta = 1$, then $\cos^2 \theta + \cos^4 \theta$ is equal to
(a) -1 (b) 1 (c) 0 (d) $\frac{1}{2}$
08. The value of $2(\cos^4 60^\circ + \sin^4 30^\circ) - (\tan^2 60^\circ + \cot^2 45^\circ) + 3\sec^2 30^\circ$ is
(a) $-\frac{1}{4}$ (b) $\frac{1}{4}$ (c) $\frac{1}{3}$ (d) $-\frac{1}{3}$
09. If $\triangle ABC \sim \triangle EDF$ and $\triangle ABC$ is not similar to $\triangle DEF$, then which of the following is not true?
(a) $BC \cdot EF = AC \cdot FD$ (b) $AB \cdot EF = AC \cdot DE$
(c) $BC \cdot DE = AB \cdot EF$ (d) $BC \cdot DE = AB \cdot FD$

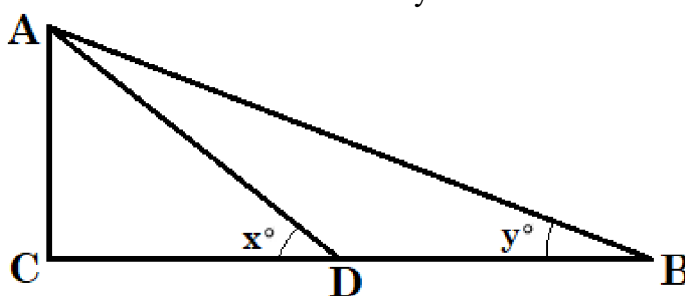
10. In the given figure, $\triangle ACB \sim \triangle AQP$. Then the value of x will be

- (a) 9 cm
(b) 10.5 cm
(c) 13.5 cm
(d) 12 cm



11. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at angle of 80° , then $\angle POA$ is equal to
(a) 50° (b) 60° (c) 70° (d) 80°
12. The number of revolutions made by circular wheel of radius 1.4 m in rolling a distance 176 m is
(a) 40 (b) 20 (c) 30 (d) 15
13. Two cones have their heights in the ratio 2 : 3 and radii in the ratio 5 : 2. Then the ratio of their volume is
(a) $\frac{25}{6}$ (b) $\frac{5}{3}$ (c) $\frac{5}{6}$ (d) $\frac{25}{3}$
14. The median of a data is 20. If each item is increased by 2. The new median will be
(a) 40 (b) 10 (c) 22 (d) None of these
15. The arc of the segment of circle has measure of 60° and radius 21 cm. Taking $\sqrt{3} = 1.73$, find the area of segment of the circle.
(a) 44.57 cm^2 (b) 40 cm^2 (c) 40 m^2 (d) None of these
16. If the mean of x and $\frac{1}{x}$ is M . The mean of x^3 and $\frac{1}{x^3}$ is
(a) $\frac{M^2 - 3}{2}$ (b) $M(4M^2 - 3)$ (c) M^3 (d) $M^3 + 3$
17. A card is drawn from a well-shuffled deck of cards. What is the probability that the card drawn is a king or queen?
(a) $\frac{11}{13}$ (b) $\frac{2}{13}$ (c) $\frac{11}{26}$ (d) $\frac{11}{52}$
18. In the given figure, D is the mid-point of BC, then the value of $\frac{\tan x^\circ}{\tan y^\circ}$ is

- (a) $\frac{1}{2}$ (b) $\frac{3}{2}$
(c) $\frac{1}{4}$ (d) 2



Followings are **Assertion-Reason based questions**.

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

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

(c) A is true but R is false.

(d) A is false but R is true.

19. **Assertion (A)** : If the Product of integers is 26×91 and $\text{LCM} = 182$, then $\text{HCF} = 13$.

Reason (R) : $\text{LCM} \times \text{Product of integers} = \text{HCF}$.

20. **Assertion (A)** : Three points A, B and C are such that $AB + BC > AC$. Then they are collinear.

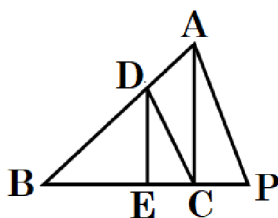
Reason (R) : Three points are collinear if they lie on a straight line.

SECTION B

(Question numbers 21 to 25 carry 2 marks each.)

21. If $47x + 31y = 18$ and $31x + 47y = 60$, then find the value of $(x + y)$.

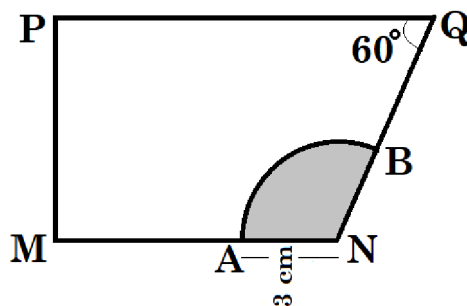
22. In the given figure, $DE \parallel AC$ and $DC \parallel AP$. Prove that $\frac{BE}{EC} = \frac{BC}{CP}$.



23. Two circles of radii 5 cm and 3 cm are concentric. Calculate the length of a chord of the circle which touches the inner circle.
24. The length of the minute hand of a clock is 14 cm. Find the area swept out by the minute hand in 1 hour.

OR

In the given figure, find the area of the shaded region when $PQ \parallel MN$.



25. Prove that $\frac{\sin \theta - 2\sin^3 \theta}{2\cos^3 \theta - \cos \theta} = \tan \theta$.

OR

Prove that $\cot A + \tan A = \sec A \operatorname{cosec} A$.

SECTION C

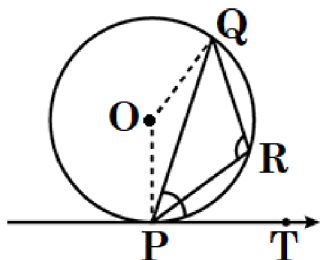
(Question numbers 26 to 31 carry 3 marks each.)

26. Prove that $5\sqrt{2}$ is irrational.
27. If α and β are the zeroes of the quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$, then find the polynomial.
28. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

OR

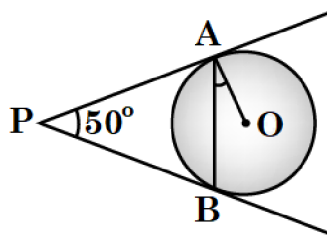
Two numbers are in the ratio 5 : 6. If 8 is subtracted from each of the numbers, then the ratio becomes 4 : 5. Find both the numbers.

29. Prove that $\frac{(1 + \cot A + \tan A)(\sin A - \cos A)}{\sec^3 A - \operatorname{cosec}^3 A} = \sin^2 A \cdot \cos^2 A$.
30. In the given figure, PQ is a chord of a circle and PT is tangent at P such that $\angle QPT = 60^\circ$. Then find the measure of $\angle PRQ$.



OR

In given figure, PA and PB are tangents to the circle with centre O, such that $\angle APB = 50^\circ$. Then find the measure of $\angle OAB$.



31. A bag contains 18 balls out of which x balls are red.
- (i) If one ball is drawn at random from the bag, then what is the probability that it is red ball?
- (ii) If 2 more red balls are put in the bag, then the probability of drawing a red ball will be $\frac{9}{8}$ times that of probability of red ball coming in part (i). Find the value of x (number of red balls).

SECTION D

(Question numbers 32 to 35 carry 5 marks each.)

32. Places P_1 and P_2 are 250 km apart from each other on a national highway. A car starts from P_1 and another from P_2 at the same time. If they travel in the same direction, they meet in 5 hours and if they go in opposite directions, they meet in $\frac{25}{13}$ hours. Find their speeds.

OR

A motorboat whose speed in still water is 9 km/h, goes 15 km downstream and comes back to the same spot, in a total time of 3 hours 45 minutes. Find the speed of the stream.

33. The vertices of a $\triangle ABC$ are $A(5, 5)$, $B(1, 5)$ and $C(9, 1)$. A line is drawn to intersect sides AB and AC at P and Q respectively such that $\frac{AP}{AB} = \frac{AQ}{AC} = \frac{3}{4}$.

Find the length of the line segment PQ.

34. A building is in the form of a cylinder surmounted by a hemispherical vaulted dome which contains 17.7 m^3 of air. If the internal diameter of dome is equal to the total height of the crown of the vault above the floor, then find the height of the building. $\left[\text{Take } \pi = \frac{22}{7} \right]$.

OR

A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 3 cm and the diameter of the base is 5 cm. If a right circular cylinder circumscribes the solid. Find how much more space it will require? Express your answer in terms of π .

35. The median of the following data is 16.
Find the missing frequencies a and b , if the total frequency is 70.

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	12	a	12	15	b	6	6	4

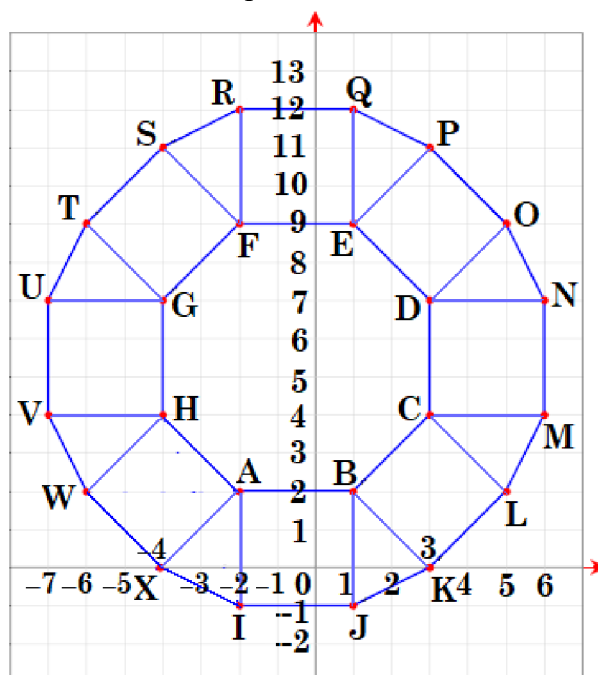
SECTION E

(Question numbers 36 to 38 carry 4 marks each.)

This section contains **three Case-study / Passage based questions**.

Each question has **three sub-parts** (i), (ii) and (iii). Two sub-parts are of **1 mark each** while the remaining third sub-part (with internal choice) is of **2 marks**.

36. **CASE STUDY I :** Mr Rahul Anand thought of making a floor pattern. To ensure accuracy in his work, he made the pattern on the Cartesian plane. He used regular octagons, squares and triangles for his floor tessellation pattern.



Use the above figure to answer the questions that follow.

- What is the length of the line segment joining points A and E?
- The centre 'Y' of the figure will be the point of intersection of the diagonals of the quadrilateral ADEH. Then what are the coordinates of Y?
- What are the coordinates of the point on y axis which is equidistant from A and G?

OR

- What is the area of Trapezium BCDE?

37. **CASE STUDY II :** Suresh wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of ₹118000 by paying every month starting with the first installment of ₹1000. Suresh increases the installment by ₹100 every month.

On the basis of above information, answer the following questions.

- Find the amount paid by him in 30th installment.
- OR
- Find the amount paid by him in first 30 installments.
 - What amount does he still have to pay after 30th installment?
 - If total installments are 40, then what amount is paid in the last installment?



38. **CASE STUDY III :** Radio towers are used for transmitting a range of communication services including radio and television. The tower will either act as an antenna itself or support one or more antennas on its structure, including microwave dishes. They are among the tallest human made structures. There are 2 main types: guyed and self-supporting structures.

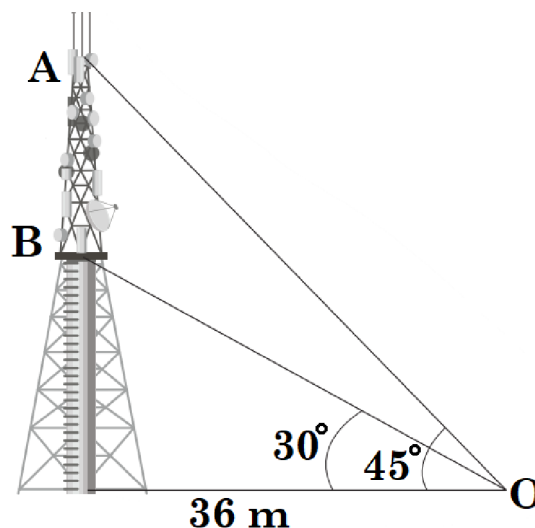
On a similar concept, a radio station tower was built in two sections A and B. Tower is supported by wires from point O. Distance between the base of the tower and point O is 36 m. From point O, the angle of elevation of the top of section B is 30° and the angle of elevation of the top of section A is 45° .

On the basis of information provided above, answer the following questions.

- (i) What is the height of the section B?
- (ii) What is the height of the section A?
- (iii) What is the length of the wire structure from the point O to the top of section A?

OR

- (iii) What is the length of the wire structure from the point O to the top of section B?



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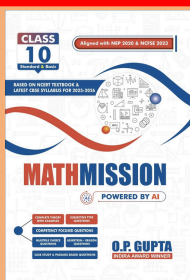
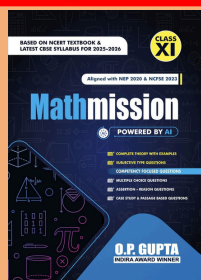
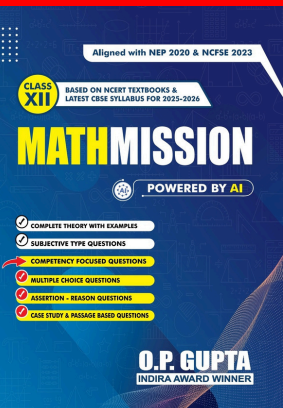
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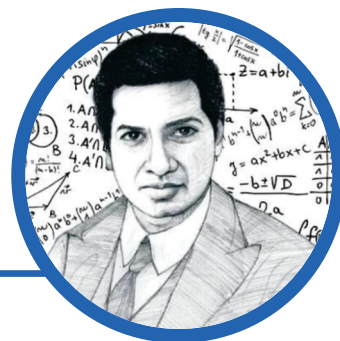
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An equation means nothing to me unless it expresses a thought of God.

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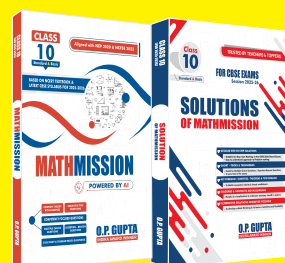
CLASS 12



CLASS 11



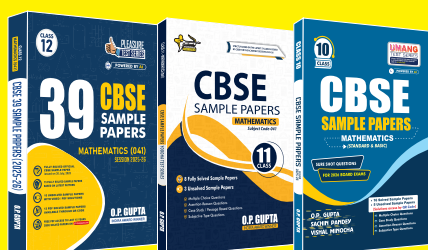
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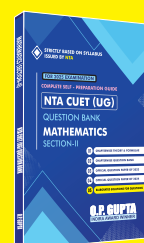
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