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## SAMPLE PAPERS

**MATHEMATICS**

*(STANDARD & BASIC)*

**SURE SHOT QUESTIONS**

**FOR 2026 BOARD EXAMS**


**O.P. GUPTA**

**SACHIN PANDEY**

**VISHAL MINOCHA**

- ✦ **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**




**UMANG  
TEST SERIES**

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

# MATHEMATICS (UTS-22)

## SAMPLE PAPER



$V = \frac{4}{3}\pi r^3$

**SURE SHOT QUESTIONS**

a compilation by  
**O.P. GUPTA**  
(INDIRA AWARD WINNER)

**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 LCM of two prime numbers  $p$  and  $q$  ( $p > q$ ) is 221. The value of  $(3p - q)$  is  
 (a) 4 (b) 22 (c) 38 (d) -38
02. If  $\alpha$  and  $\beta$  are the zeros of the polynomial  $f(x) = px^2 - 2x + 3p$  and  $\alpha + \beta = \alpha\beta$ , then the value of  $p$  is  
 (a)  $-\frac{2}{3}$  (b)  $\frac{2}{3}$  (c)  $\frac{1}{3}$  (d)  $-\frac{1}{3}$
03. The lines  $x = a$  and  $y = b$  are  
 (a) intersecting lines (b) parallel lines (c) overlapping lines (d) cannot be determined
04. The number of real roots of the equation  $(x-1)^2 + (x-2)^2 + (x-3)^2 = 0$  is  
 (a) 0 (b) 1 (c) 2 (d) 3
05. General term of an A.P. is given by  $T_n = 3 - 5n$ . Common difference of the same A.P. is  
 (a) 3 (b) 5 (c) -3 (d) -5
06.  $\triangle ABC$  is such that  $AB = 3$  cm,  $BC = 2$  cm,  $CA = 2.5$  cm. If  $\triangle ABC \sim \triangle DEF$  and  $EF = 4$  cm, then perimeter of  $\triangle DEF$  is  
 (a) 7.5 cm (b) 15 cm (c) 22.5 cm (d) 30 cm
07. Distance between the points  $(7, -2)$  and  $(-2, 7)$  is  
 (a) 9 units (b) 81 units (c)  $9\sqrt{2}$  (d) 6 units
08. If  $\cos A = \frac{3}{5}$ , then the value of  $9\sin^2 A - 9$  is  
 (a)  $\frac{9}{25}$  (b)  $\frac{25}{9}$  (c)  $-\frac{9}{25}$  (d) None of these
09. If  $x = a \cos \theta$  and  $y = b \sin \theta$ , then  $x^2b^2 + y^2a^2 =$   
 (a)  $a^2b^2$  (b)  $a^2b$  (c)  $a^2 + b^2$  (d)  $2a^2b^2$
10. If the length of a tangent drawn from a point  $A$  at a distance of 10 cm from the centre of the circle is 8 cm, then the diameter of the circle is  
 (a) 6 cm (b) 12 cm (c) 3 cm (d) 18 cm
11. Length of minute hand of a clock is 14 cm. What will be approximate area swept by it in 5 minutes?  
 (a)  $51 \text{ cm}^2$  (b)  $25 \text{ cm}^2$  (c)  $32 \text{ cm}^2$  (d)  $43 \text{ cm}^2$
12.  $ABC$  is an equilateral triangle inscribed in a circle with centre  $O$ . If  $AB = 6$  cm, then radius of the circle is  
 (a)  $2\sqrt{3}$  cm (b)  $3\sqrt{3}$  cm (c)  $\sqrt{3}$  cm (d) None of these
13. Mean of the data 2, 3, 4, 4, 5 is  
 (a) 1.8 (b) 2.5 (c) 4 (d) 3.6



14. If the ratio of the height of a tower and length of its shadow is  $\sqrt{3}:1$ , then what is the angle of elevation of the sun?  
 (a)  $30^\circ$  (b)  $45^\circ$  (c)  $60^\circ$  (d)  $75^\circ$
15. If the mid-point of certain class limit is 20 and class size is 5, then class limits are  
 (a) 20 - 25 (b) 18 - 22 (c) 17.5 - 22.5 (d) 17 - 23
16. Two dice are thrown simultaneously. The probability of getting their sum more than 10 is  
 (a)  $\frac{1}{36}$  (b)  $\frac{1}{18}$  (c)  $\frac{1}{12}$  (d)  $\frac{1}{9}$
17. A cone of maximum size is hollowed out of a cube of side 12 cm. Then what is the radius of the cone?  
 (a) 12 cm (b) 6 cm (c) 4.5 cm (d) cannot be determined
18.  $1 - 2 \sin A \cdot \cos A =$   
 (a)  $(1 - \cos A)^2$  (b)  $(1 - \sin A)^2$   
 (c)  $(\sin A + \cos A)^2$  (d)  $(\cos A - \sin A)^2$  or  $(\sin A - \cos A)^2$

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

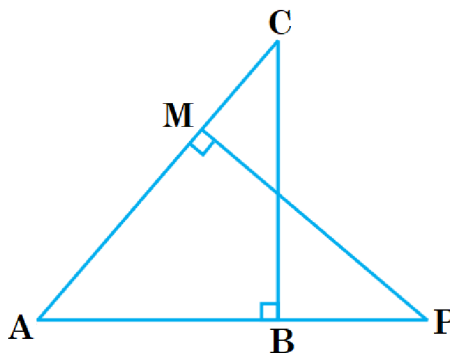
In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (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 radius of sphere is doubled, its volume will get 8 times.  
**Reason (R)** : If radius of sphere is doubled, its surface area will get 4 times.
20. **Assertion (A)** : Sum of n terms of an AP is always a quadratic polynomial.  
**Reason (R)** : General term of an AP is always a quadratic polynomial.

## SECTION B

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

21. Find HCF and LCM of 25, 35 and 45 by prime factorization method.
22. In  $\triangle ABC$  and  $\triangle AMP$  are two right triangles, right angled at B and M respectively. Prove that  $\triangle ABC \sim \triangle AMP$ .



23. TP and TQ are the tangents to a circle with centre O and radius 6 cm. If  $\angle POQ = 90^\circ$ , then find the area of quadrilateral TPOQ.
24. Evaluate :  $\left( \frac{\sin 30^\circ + \cos^3 60^\circ}{\tan^2 45^\circ - \sec^2 45^\circ} \right)^2$ .

OR

Find x :  $\sin^2 30^\circ \cdot \cos^2 30^\circ - x \tan^2 60^\circ = 1 + \sec^2 45^\circ$ .

25. Find the length of arc of a circle of radius 21 cm, if sector angle is  $120^\circ$ .

OR

Find the distance travelled by the tip of 7 cm long hour hand in 2 days.

### SECTION C

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

26. For the following statements, give reason to support your answer.

(i)  $\pi$  is irrational.

(ii)  $23 \times 29 + 29 \times 31$  is a composite number.

(iii)  $25^n$  will never end with zero for any natural number  $n$ .

27. If  $\alpha^2$  and  $\beta^2$  are the zeroes of  $x^2 - 5x + 4$ , then find the value of  $\frac{1}{\alpha} + \frac{1}{\beta}$ ; (assume  $\alpha, \beta > 0$ ).

28. Aditya tells his daughter Sunaina, "7 years ago, I was seven times as old as you were then. Also 3 years later, I will be three times as old as you will be." Find their present ages.

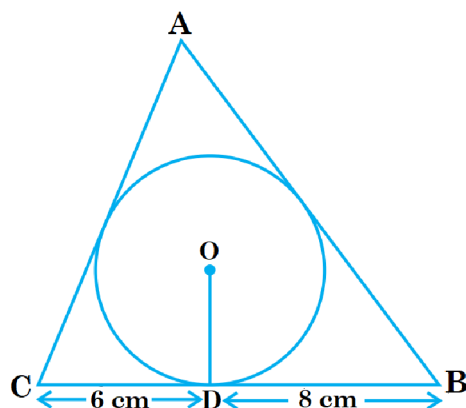
OR

Solve for  $x$  and  $y$ :  $\frac{x+3}{3} + \frac{y-2}{2} = \frac{1}{3}$ ,  $\frac{2x}{3} + \frac{3y}{2} = -\frac{11}{6}$ .

Hence find the value of  $(p)$ , if  $px + 3y = 87$ .

29. If  $\tan A + \sec A = m$ , prove that  $\sec A = \frac{m^2 + 1}{2m}$ .

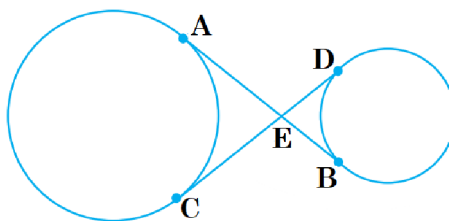
- 30.



A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively. Find the sides AB and AC.

OR

In the given figure, common tangents AB and CD to two circles intersect at E. Prove that  $AB = CD$ .



31. Find mean of the following data using assumed mean method :

Class interval	0-5	5-10	10-15	15-20	20-25	25-30
Frequency	4	7	12	2	0	15

### SECTION D

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

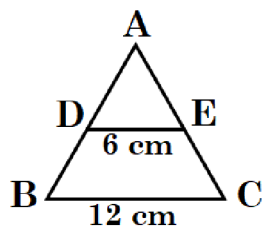
32. A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?

OR

If Zeba were younger by 5 years than what she really is, then the square of her age (in years) would have been 11 more than five times her actual age. What is her age now?

33. Prove basic proportionality theorem.

In the given figure, DE is parallel to BC. Find ratio of perimeters of triangles ABC and ADE.



34. 500 persons are taking a dip into a cuboidal pond which is 80 m long and 50 m broad. What is the rise of water level in the pond, if the average displacement of the water by a person is  $0.04 \text{ m}^3$ ?

OR

Water flows through a cylindrical pipe, whose inner radius is 1 cm, at the rate of 80 cm/sec in an empty cylindrical tank, the radius of whose base is 40 cm. What is the rise of water level in tank in half an hour?

35. Median of the following data is 50. Find the values of p and q.

Marks obtained	Number of students
20 - 30	p
30 - 40	15
40 - 50	25
50 - 60	20
60 - 70	q
70 - 80	8
80 - 90	10
Total	90

## 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 :** Pihu was given her pocket money on January 1st, 2025. She puts ₹1 on Day 1, ₹2 on Day 2, ₹3 on Day 3, and continued doing so till the end of the month, from this money into her piggy bank.

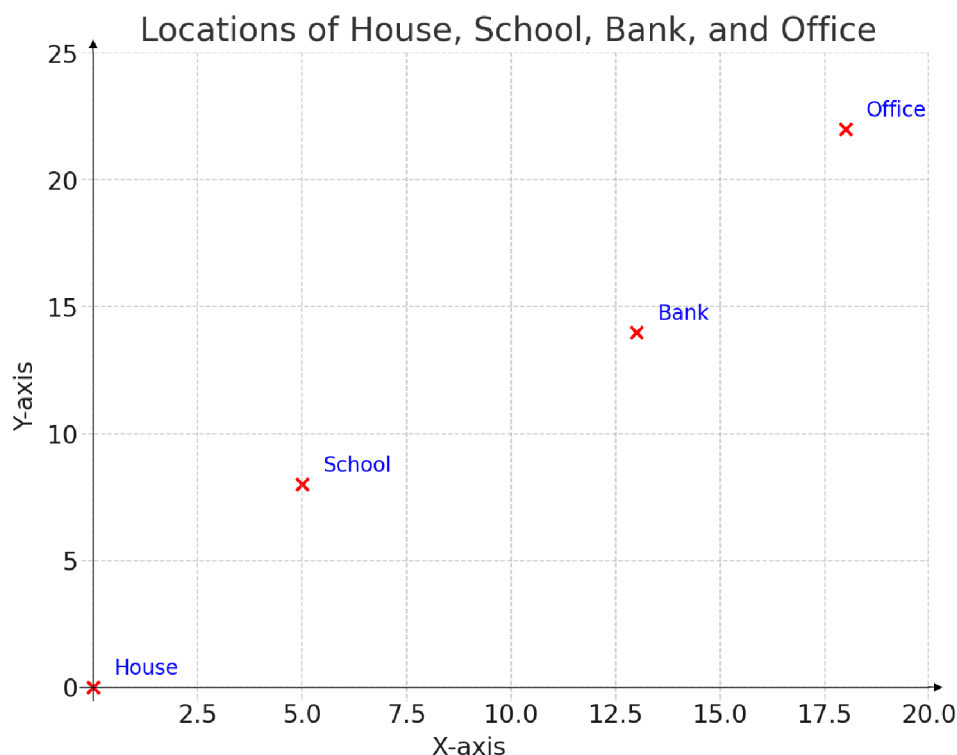


- (i) How much Pihu would have saved at the end of month?
- (ii) If Pihu spent ₹54 on her subscribed books on the last day of month, then how much amount she would be left with?
- (iii) If Pihu puts ₹31 on Jan 1, ₹30 on Jan 2, ₹29 on Jan 3 and so on till Jan 15 in her piggy bank, then what would be her total effective savings at the end of January? (Keep in mind that she does not get any money after January 15 and that she has to spend ₹54 on her subscribed books).

OR

- (iii) If Pihu puts with ₹1 on Jan 1, ₹2 on Jan 2, ₹3 on Jan 3 and so on till a specific date in January, then what would be the date in January when her total savings will become ₹276? (Assume that she doesn't spend on her books subscriptions).

37. **CASE STUDY II :** The positions of house, school, bank and office are (0, 0), (5, 8), (13, 14) and (18, 22) respectively.



Lisha started from her house, drops her daughter to school, then deposits some amount in bank via ATM machine and then goes to her office.

- (i) Find the distance between house and school?
- (ii) Find the distance between bank and office.
- (iii) Check if the house, school and bank are in a straight line.

OR

- (iii) Find the total distance travelled by Lisha from house to office.

38. **CASE STUDY III :** An aeroplane is a vehicle with the wings and one or more engines that enable it to fly through the air.



An aeroplane flying at a height of 600 m observes the angles of depressions of opposite points on the two banks P and Q of river to be  $30^\circ$  and  $60^\circ$ .

- (i) Find the width of the river.

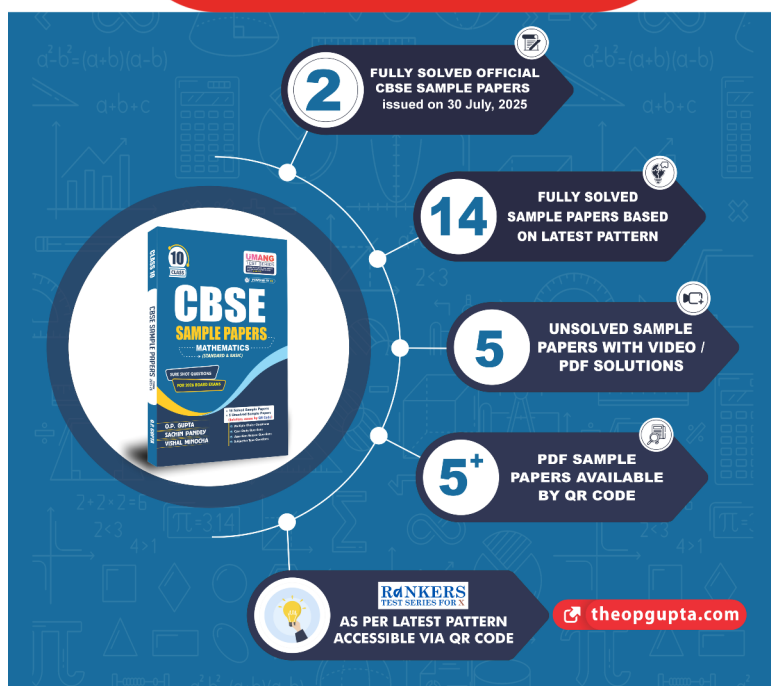
- (ii) If aeroplane covers 5 km in 20 seconds, then find the speed of the plane in kmph.  
 (iii) Find the distance of aeroplane from point P.  
**OR**  
 (iii) Find the distance of aeroplane from point Q.

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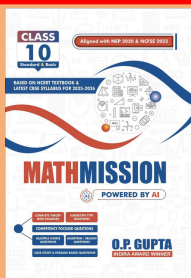
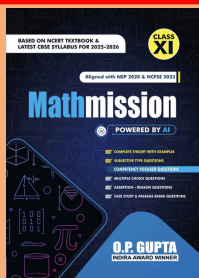
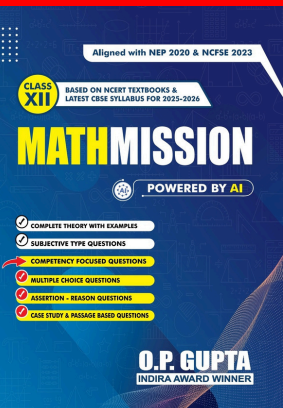
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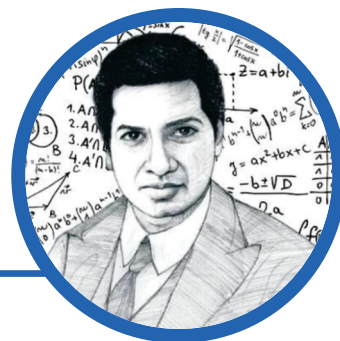
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An equation means nothing to me unless it expresses a thought of God.

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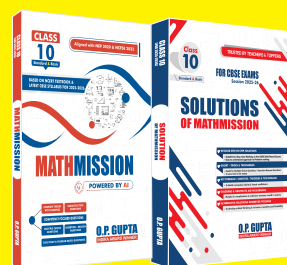
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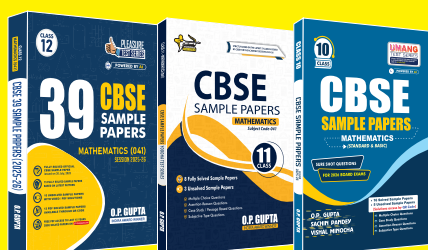
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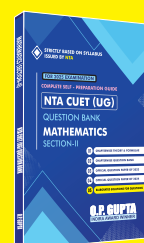
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