

**CLASS 10<sup>TH</sup> CBSE MATHEMATICS**  
**MOCK TEST-1**  
**TERM-2**

**T.T-2 Hr**  
**Instructions**

**M.M- 40**

1. The question paper contains three sections A, B and C
2. Section A has 6 questions with 2 internal choices.
3. Section B has 4 questions with 1 internal choices
4. Section Chas 4 questions including 2 case study.
5. There is no negative marking.

**SECTION A**

(3 Marks Each)

This section consists of 6 questions of Short Answer Type.

1. Find the value of  $m$  for which the quadratic equation  $(3m+1)x^2 + 2(m+1)x + 1 = 0$ , has equal roots. Also find these roots.
2. 4<sup>th</sup> term of an AP is equal to 3 times its first term and 7<sup>th</sup> term exceeds twice the 3<sup>rd</sup> term by 1. Then find the common difference.

OR

If two towers of heights  $p$  m and  $q$  m subtend angles of  $45^\circ$  and  $60^\circ$ , respectively At the center of a line joining their feet, then find the ratio of  $(p + q) : q$ .

3. The length of common chord of two intersecting circles is 24 cm. If the diameters of these two circles are 40 cm and 26 cm, then calculate the distance between their centres.

OR

Given, a line segment  $AB$ . Divide in it the ratio  $m : n$  by construction, where both  $m$  and  $n$  are positive integer and let  $m = 2$  and  $n = 3$ .

4. From a solid cube of side 14 cm, a conical cavity of height 14 cm and radius 6 cm is hollowed out. Find the volume of the remaining solid.
5. The mode of the following series is 36. Find the missing ( $x$ ) frequency in it.

Class interval	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Frequency	8	10	$x$	16	12	6	7

6. The 8<sup>th</sup> term of an A.P is 17 and its 14<sup>th</sup> term is 29. Find its common difference.

**SECTION B**

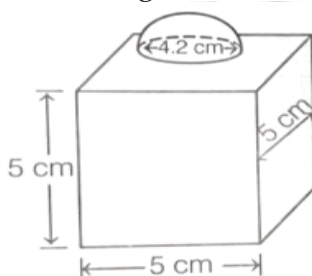
(3 Marks Each)

This section consists of 4 questions of Long Answer Type

7. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure its length. Also, verify the measurement by actual calculation.

Or

A decorative block as shown in figure is made of two solids, a cube and a hemisphere.



The base of the block is the cube with edge of 5 cm and the hemisphere attached on the top has a diameter of 4.2 cm. If the block is to be painted, then find the total area to be painted. [Take,  $\pi = 22/7$ ]

8. Water flows at the rate of 10m/minute through a cylindrical pipe 5 mm in diameter. How long would it take to fill a conical vessel whose diameter at the base is 40 cm and depth 24 cm?
9. Find the solution of the equation  $\frac{x}{3} + \frac{3}{6-x} = \frac{2(6+x)}{15}$ ; ( $x \neq 6$ )
10. Find the median for the following frequency distribution.

Height (in cm)	160 - 162	163 - 165	166 - 168	169 - 171	172 - 174
Frequency	15	117	136	118	14

**SECTION C**

(4 Marks Each)

11. From the point, 36 m above the surface of a lake, the angle of elevation of a bird is observed to be  $30^\circ$  and angle of depression of its image in the water of the lake is observed to be  $60^\circ$ . Find the actual height of the bird above the surface of the lake.

Or

Prove that two parallel tangents to a circle subtends a right angle at the centre.

12. A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as  $60^\circ$  and the angle of depression of the base of a hill as  $30^\circ$ . Then find the sum of distance of the hill from the ship and height of the hill is (in metres).

13. Case study 1

Karan aspires to be an architect someday. He knows that he has to have a good knowledge of various shapes and figures but he does not have much interest in geometry. His math teacher recommended him to watch a movie "Flatland - A Romance of many dimensions", based on the book of same title by Edwin A Abbott, where the narrator (himself a square) describes a world living in two dimensions being visited by a person living 3D. After watching this, he got curious to test the relationship between 2D & 3D objects.

He cut out a very thin right angled triangle whose sides are in A.P. The square of the base of the triangle is 16 more than the product of hypotenuse and perpendicular. He places the triangle perpendicular to the plane of the paper and traces a shape in 2D & 3D by revolving the triangle along the perpendicular.  
(Base > Perpendicular)

- (i) Find the area of the shape obtained in 2D [2 marks]  
(ii) Find the volume of the shape obtained in 3D. [2 marks]

14. Case study 2 :

In a mathematics class, a teacher explain the concept of determine the mean by defining

the formula  $\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$ .



Further, a teacher give one example for explaining the above concept. The marks obtained by 30 students of class X a certain school in a mathematics paper consisting of 100 marks are presented in table below

Class interval	10 - 25	25 - 40	40 - 55	55 - 70	70 - 85	85 - 100
No. of students	2	3	7	6	6	6

- (i) Find the average marks obtained by the students.  
 (a) 61                      (b) 62                      (c) 63                      (d) 64
- (ii) Find the cumulative frequency value in the interval (40-55)  
 (a) 5                          (b) 12                      (c) 2                          (d) 18
- (iii) Through cumulative frequency table, which central measurement can be determined?  
 (a) Mean                      (b) Mode                      (c) Median                      (d) None of these
- (iv) Find the lower limit of the median class.  
 (a) 55                          (b) 40                          (c) 70                          (d) 25

**ANSWER KEY**

1.  $-\frac{1}{2}$  and  $-\frac{1}{2}$     2. 2 OR  $(x + y) : y$  is  $(1 + \sqrt{3}) : \sqrt{3}$ .    3. 21 cm OR  $\frac{AC}{BC} = \frac{4}{3}$     4.  $2.2216\text{cm}^3$

5. 10    6.2    7. 4.5 cm OR  $163.86\text{ cm}^2$     8. 51 min 12 sec    9. 1 or 9  
 10.  $10.167\text{cm}$     11.  $72\text{ m OR }90^\circ$   
 12.  $40+10\sqrt{3}\text{ m}$     13.14. (i) 62 (ii) 12 (iii) (iv) 55