

# CBSE SAMPLE PAPERS - 2

Class - X

Max.Marks-80

Time – 3 hours

Subject-Mathematics

## General Instruction

- I. All the question are compulsory.
- II. This question paper consists of 25 question divided into three sections A, B, and C.  
Section A contains 7 questions of 2 marks each,  
Section B contains 12 questions of 3 marks each,  
Section C contains 6 questions of 5 marks each.
- III. Internal choices have been provided for some question .you have to attempt only one of the choices in such question
- IV. Write correct serial number of the question before attempting it.
- V. In the question on construction, the drawing should be neat and exactly as per given measurements.
- VI. Use of Calculator s is not permissible. However you may ask for mathematical tables.

## SECTION : A

1. Solve the system of equations

$$\frac{18}{u} + \frac{2}{v} = 17, \quad \frac{7}{u} + \frac{1}{v} = \frac{36}{8}.$$

OR

Solve for x and y:

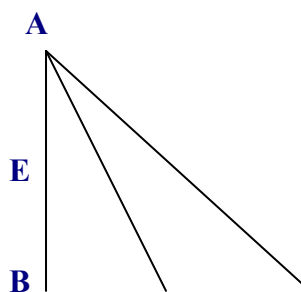
$$\frac{x}{a} + \frac{y}{b} = a + b, \quad \frac{x}{a^2} + \frac{y}{b^2} = 2$$

2. Find the 50<sup>th</sup> term of an A.P., if first term of an A.P is 5 and its 100<sup>th</sup> term is -292
3. If the sum of first n terms of an AP is  $3n^2 - 2n$ , find the A.P and its 19<sup>th</sup> term.
4. A loan has to be returned in two equal annual installments. It the rate of interest is 16% per annual compounded annually and each installment is of Rs 1682. Find the sum barrowed and total interest paid.

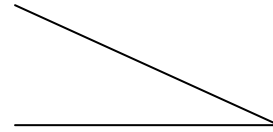
OR

A sum of Rs.8, 400/- is borrowed at 10% per annum compound interest, to be paid back in 2 years by two equal annual instalments. Find the value of each installment.

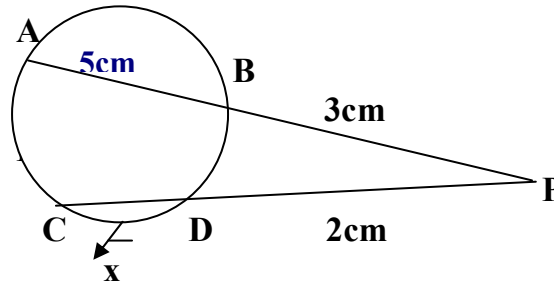
5. In fig., ABC is a right triangle , right angled at B. Medians AD and CE are of respective



lengths 5cm and  $2\sqrt{5}$ cm. Find the length of AC



6. Two cords AB and CD of a circle intersect each other at P outside the circle. If AB=5cm, BP=3cm and PD=2cm find CD.



7. Find the Probability of getting a prime no when a 100 page text book is opened randomly.

### SECTION B

8. Solve graphically  $4x-y=4$   
 $4x+y=12$

Also find Co-ordinates of the points where the line meets y-axis

9. Find g.c.d and L.C.M of the following polynomials

$$P(x) = 12(x^4-25), q(x) = 8(x^4+4x^2-5)$$

10. Simplify

$$\frac{x^3 - a^3}{x^3 + b^3} \times \frac{x^2 + ax + bx + ab}{x^4 + a^2x^2 + a^4} \div \frac{x^2 - a^2}{x^3 + a^3}$$

**OR**

Solve that  $x \frac{x+1}{x-1} + \frac{x-2}{x+2} = 3 \quad (x \neq 1, -2)$

11. A point is at a distance of  $\sqrt{10}$  from the point (2,3). Find the coordinates of the point P if its y coordinate is twice of the x coordinate.
12. A and B are the end-points of a diameter of a circle having its centre at (1,2). If the coordinates of A are (-3, 5), find the coordinates of the point B.
13. The radius of a solid iron sphere is 3cm. It is melted and recast into a solid cylinder of diameter 2cm. Find the height of the cylinder so formed, assuming that there is no wastage of metal in the process.

14. Prove that

$$(\cos \theta + \sec \theta)^2 + (\sin \theta + \operatorname{cosec} \theta)^2 = 7 + \tan^2 \theta + \cot^2 \theta$$

**OR**

Evaluate without using tables

$$\cot \theta \tan(90^\circ - \theta) - \sec(90^\circ - \theta) \operatorname{cosec} \theta + \sin^2 25^\circ + \sin^2 65^\circ \\ + \sqrt{3}(\tan 5^\circ \tan 45^\circ \tan 85^\circ)$$

15. Draw a  $\square PQR$  in which  $PQ = 5$  cm,  $\angle Q = 45^\circ$  and  $qr = 5.4$  cm construct the incircle of  $\square PQR$ .

16. A Radio is available for Rs. 450 cash or Rs. 110 cash down payment followed by 5 equal monthly instalments of Rs. 70 each. Find the rate of interest charged under the installment scheme.

17. An isosceles triangle  $ABC$  is inscribed in a circle. If  $AB = AC = 13$  cm and  $BC = 10$  cm Find the radius of the circle.

18.  $D, E$  and  $F$  are respectively the mid-points of the sides  $BC, CA$  and  $AB$  of  $\square ABC$ . Find the ratio of the areas of  $\square DEF$  and  $\square ABC$ .

19. The expenditure of a household on various heads is given below.

Heads	Expenditure (in Rs.)
Rent	3000
Food	9000
Education	1000
Clothing	2000
Miscellaneous	3000

Represent the data by a pie chart.

### SECTION: C

20. A two digit no. is such that the product of the digits is 20. If 9 is subtracted from the number, the digit interchange their places. Find the number.

21. A tent of height 8.25m is the form of a right circular cylinder with diameter of base 30m and height 5.5m, surmounted by a right circular cone of the same base. Find the cost of canvas of the tent at the rate of Rs 45 per  $m^2$

**OR**

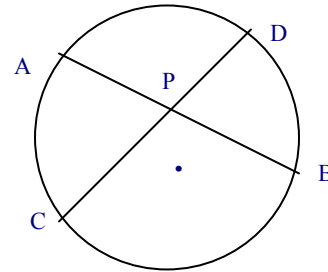
The internal radii of the ends of a bucket, full of milk and of internal height 16cm, 14 cm and 7 cm. If this milk is poured into a hemispherical vessel, the vessel is completely filled. Find the internal diameter of the hemispherical vessel.

22. An aeroplane when flying at a height of 4000m from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two planes from the same point on the ground are  $60^\circ$  and  $45^\circ$  respectively. Find the vertical distance between the aeroplanes at that instant.
23. Ramesh has a monthly salary of Rs 31250 (excluding HRA). He contributes Rs. 7000 per month towards GPF during the year and pays a quarterly premium of Rs 2500 for his LIC policy. He invests Rs 10,000 in NSCs. He has donated Rs 16, 000 to a charitable trust (50% deduction for income tax). Calculate the income tax liability of Ramesh if he has paid Rs 2500 per month as income tax for the first 11 months of the year.

24. If two chords of a circle intersect inside or outside the circle, the rectangle formed by the two parts of one chord is equal to the area of the rectangle formed by the two parts of the other. Prove it.

Using the above, prove the following

In figure AB and CD are two chords of a circle intersecting each other at P such that  $AP = CP$ . Show that  $AB = CD$



OR

The ratio of the areas of similar triangle is equal to ratio of the squares on the squares on the corresponding sides. Using the above theorem, prove that the area of equilateral triangle described on the sides of a square is half the area of equilateral triangle described on its diagonal.

25. Find the missing frequencies 'p' and 'q' in the following data if the mean is 22 and sum of observation is 50

C.I	0-10	10-20	20-30	30-40	40-50
Frequency	12	'p'	6	'q'	9