

**Sample Paper – 2007**  
**Class - X**  
**MATHEMATICS**

**TIME – 2.45 HRS**  
**Full Marks -80**

**General Instructions:**

1. All questions are compulsory
2. The question paper consists of **25** questions divided into three sections **A, B** and **C**. Section A contains 7 questions of 2 marks each. Section B is of 12 questions of 3 marks each and Section C is of 6 marks each.
3. There is no overall choice. However, internal choice has been provided in two questions of two marks each. Two questions of three marks each and two questions of five marks each.
4. In question on construction, the drawing should be neat and exactly as per the given measurements.
5. Use of calculators is not permitted. However you may ask for mathematical tables.

**SECTION-A**

1. Solve the following system of equation graphically  
2  
1.  $5x - y = 7$   
2.  $x - y = -1$
2. Find the A.P whose third term is 16 and 7<sup>th</sup> term exceeds its birth term by 12.  
2
3. A loan of Rs. 33,100 is to be paid back in three equal annual installments. If the rate of interest is 10% p.a compounded annually. Find the installment.  
2
4. A solid metallic cylinder of radius 14 cm and height 21cm is melted and recast into 72 equal small sphere. Find the radius of each.  
2
5. A bag contains 5 red balls,8 white balls, 4 green balls and 7 black balls. A ball is drawn at random from the bag. Find the probability that it is  
a. i. Blackii. Not green  
2
6. Solve :  $X^2 - X + \frac{1}{4} = 0$   
2
7. Solve for X and Y.  
2  
a.  $(a - b)x + (a + b)y = a^2 - 2ab - b^2$   
b.  $(a + b)(x + y) = a^2 + b^2$

**SECTION-B**

8. The GCD and LCM of two polynomials P(x) and Q(x) are  $x(X+a)$  and  $12x^2(X+a)(X^2 - a^2)$  respectively, if  $P(x) = 4x(x + a)^2$ , find Q(x)

9. Solve for x

$$a. \frac{x-1}{x-2} + \frac{x-3}{x-4} = \frac{10}{3} \quad (x \neq 2, x \neq 4)$$

10. Express as a rational expression.

$$\frac{1}{x+1} - \frac{1}{x-1} - \frac{x^2}{x+1} + \frac{x^2}{x-1}$$

11. The 10<sup>th</sup> term of an A.P. is 57 and its 15<sup>th</sup> term is 87. Find A.P.

A Watch is sold at Rs. 235 cash or Rs. 50 as cash down payment and Rs. 33.50 a month for. Find the rate of interest charged under the installment plan.

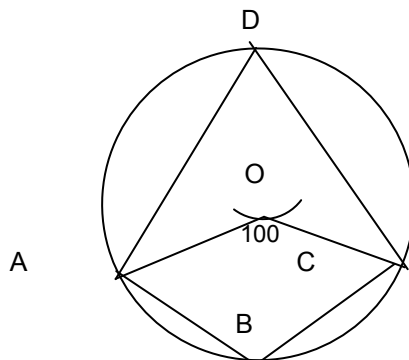
12. Prove that

$$1. \frac{\tan^3 \theta}{1 - \cot \theta} + \frac{\cot^3 \theta}{1 - \tan \theta} = 1 + \sec \theta \cdot \operatorname{Cosec} \theta$$

13. Find a point in the x axis which is equidistance from the point (7, 6) and (-3, 4)

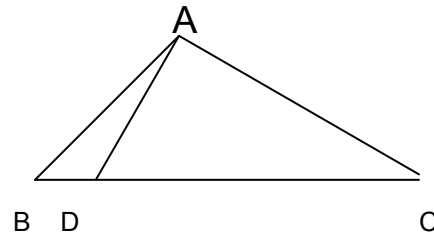
14. Three consecutive vertices of a parallelogram ABCD are A(1, 2), B(1, 0) and C(4, 0). Find the fourth vertex D

15. O is the center of the circle and measure of arc ABC is 100°. Determine ∠ABC and ∠ADC.



16. In a given figure D is a point on side BC of Δ ABC such that ∠ADC = ∠BAC

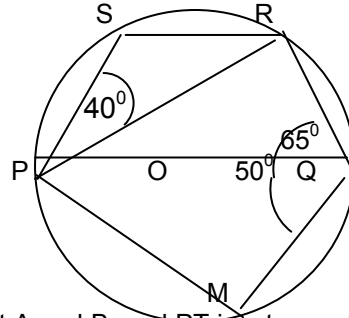
17. Prove that,  $\frac{CA}{CD} = \frac{CB}{CA}$



18. Construct a triangle ABC in which BC = 6.5cm ∠A = 60° and median AD = 4.5cm.

## SECTION-C

19. In the figure, PQ is a diameter of a circle with center O. If  $\angle PQR = \angle PRS = 65^\circ$ ,  $\angle SPR = 40^\circ$ ,  $\angle PQM = 50^\circ$ , Find  $\angle QPR$ ,  $\angle PRS$ , and  $\angle QPM$ .



20. If PAB is a secant to a circle intersecting the circle at A and B. and PT is a tangent to the circle at T. Prove that  $PT^2 = PA \times PB$ .

5

21. Draw the pie chart.

5

Activity	Sleep	School	Home work	Play	Others
Number of hours	7	8	4	3	2

22. If a line is drawn parallel to one side of a triangle, Prove that the other two sides are divided in the same ratio.

5

Using the above result prove that the diagonals of a trapezium divide each other in the same ratio.

23. From the top of a tower 60m high the angles of depression of the top and bottom of a building whose base is in the same straight line with the base of the tower are observed to be  $30^\circ$  and  $60^\circ$ . Find the height of the building?

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24. Anil's total annual salary excluding HRA is Rs. 2,01,000. He contributes Rs 5000 per month in his G. P.F. How much should he invest in N.S.C to get maximum rebate? After getting maximum rebate he wants to pay income tax in equal monthly installment. Find the amount of tax, he has to pay during the year?

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Assume the following for calculating income tax.

a) Standard deduction i. 40% of the income when gross income is up to RS 75,000.

ii. Rs 30,000 when gross income is from Rs 75,000 for Rs 5,00,000.

iii. Rs 20,000 when gross income is above 5,00,000.

b) Rate of income tax slab.	Income tax .
Up to Rs 50,000	No tax
From Rs 50001 to Rs 60000.	10% of the amount exceeding Rs. 50,000 .
From Rs 60001 to Rs 1,50,000. Rs 60000	Rs 1000 + 20% of the amount exceeding
Above Rs 150,000. exceeding Rs. 1,50,000	Rs 19000 + 30% of the amount

c) Rebate in income tax.	i.20% of the amount of saving subject to a
maximum of Rs	14000 if net salary is up to Rs.1,50,000.

- a. ii 15% of the amount saving subject to a maximum of Rs 10,500 . If net salary is above Rs 1,50,000 . but not exceeding Rs 5,00,00.

25. A circus tent is cylindrical to a height of 3cm and conical above it. If its base radius is 52.5 m and slant height of the conical proportion is 53m. Find the area of the canvas needed to make the tent. 5