CLASS X
GUESS PAPER
MATHEMATICS

Time: 3hrs **Max 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 questions of 5 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 linear equations :

$$62x+37y=13$$
$$37x+62y=-112$$

2. Express the following expression as a rational expression in lowest terms :

$$\frac{x^3-8}{x^2-4}\times\frac{x^2+6x+8}{x^2-2x+1}+\frac{x^2+2x+4}{x^2+2x-3}$$

3. Solve the following quadratic equation for x :

$$x^2-2(a+2)x+(a+1)(a+3)=0$$

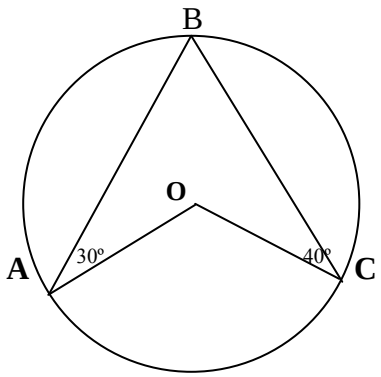
4. The first term of an A.P is 5 and its 100th term is −292. Find the 50th term of this A.P.

OR

Which term of the Arithmetic progression 3, 9, 15, 21… will be 72 more than its 19th term?

5. A room cooler is available for Rs 1500.00 cash payment or for Rs 360.00 cash down payment followed by three equal monthly instalments of Rs 390 each. Find the rate of interest charged under the instalment plan.

6. Calculate the measure of $\angle AOC$



7. Two coins are tossed simultaneously. Find the probability of getting at least one head.

OR

Find the probability of getting 53 Fridays in a **non – leap** year.

SECTION – B

8. Solve the following system of linear equations graphically :

$$3x + 2y + 4 = 0$$
$$3x - 2y + 8 = 0$$

Also find the coordinates of the vertices of the triangle formed by the lines representing the above equations and the y– axis.

9. If $(x - 2)(x + 3)$ is G.C.D. of $p(x) = (x^2 - 3x + 2)(ax^2 + 7x + 3)$ and $q(x) = (3x^2 + 8x - 3)(x^2 + bx + 6)$, find a and b.

10. If the sum of first n terms of an A.P. is $3n^2 - 2n$, find the A.P. and its 19th term.

11. The sum of the squares of two positive integers is 117. If the square of the smaller number equals four times the larger number, find the integers.

OR

A passenger train takes one hour less when its speed is increased by 15 km/hour than its usual speed for a journey of 300km. Find the usual speed of the train.

12. Construct a quadrilateral ABCD, with $\angle A = 45°$, AB = 5.1cm, AC = 6cm, AD = 4.2cm and BC = 3.6cm. Construct a quadrilateral AB′C′D′ similar to quadrilateral ABCD such that its diagonal AC′ = 8cm.

13. In Fig. 2, ABC and DBC are two triangles on the same base BC. Prove that

$$\frac{ar(\Delta ABC)}{ar(\Delta DBC)} = \frac{AO}{DO}$$

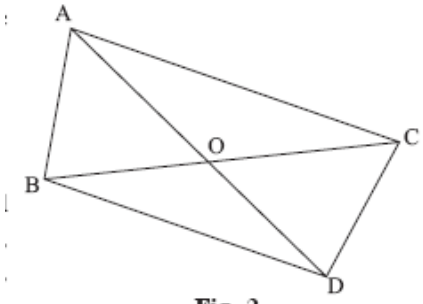


Fig. 2

14. Prove that

$$\frac{\sec\theta + \tan\theta - 1}{\tan\theta - \sec\theta + 1} = \frac{1 + \sin\theta}{\cos\theta}$$

OR

Without using trigonometric tables, find the value of

$$\sin 31°.\ \sec 59° + \left(\frac{\tan 67°}{\cot 23°}\right)^2 + \sin^2 35° - \cos^2 55°$$

15. A sum of Rs. 10,815 is to be paid back in 3 equal half yearly instalments. If the rate of interest charged is 40/3 % p.a. compunded half yearly , find each instalment.

16. Find the mass of a hollow metal pipe 4.2 m long whose external diameter is 6 cm and thichness of the metal is 1 cm . The density of metal is given by 11 gm / cm^3 .

17. The number of hours spent by a school going student on various activities on a working day are given below :

Activity	Number of Hours
School	7
Sleep	8
Home Work	5
Other jobs	4

Represent the above information by a pie-chart.

18. Find the coordinates of a point P on *y*-axis, equidistant from two points A(–3, 4) and B (3, 6) on the same plane.

19. Show that the points (1, 2), (2,0) and (3, –2) are collinear.

SECTION – C

20. Ms, Pooja is an executive in an export firm. Her annual income from salaries (excluding HRA) is Rs 5,72,000. She contributes Rs 10,000 per month in her P.F. account, pays Rs 16,800 as L.I.C. premium and purchases NSCs worth Rs 14,000. She paid Rs 1,60,500 as advance tax. What refund , if any, she will get from Income Tax Department?

Use the following for calculating income tax :

(*a*) Savings : 100% exemption for savings upto Rs 1,00,000.

(*b*) Rates of income tax :

Slab		Income Tax
Income :		
(*i*) Upto Rs 1,35,000	:	No tax

(*ii*) From Rs 1,35,001 to Rs 1,50,000 : 10% of the amount exceeding Rs 1,35,000.

(*iii*) From Rs 1,50,001 to Rs 2,50,000 : Rs 1,500 + 20% of the amount exceeding Rs 1,50,000.

(*iv*) Above Rs 2,50,000 : Rs 21,500 + 30% of the amount exceeding Rs 2,50,000.

(*c*) Education Cess : 2% of the tax payable

21. The angle of elevation of the top of a tower at a point on the horizontal line through the foot of the tower is 45°. After walking a distance of 80m towards the foot of the tower along the same horizontal line, the angle of elevation of the top of the tower changes to 60°. Find the height of the tower.

OR

The angles of elevation of the top of a tower from two points P and Q at distances of a and b respectively from the base and in the same straight line with it are complementary. Prove that the height of the tower is $\sqrt{ab}$.

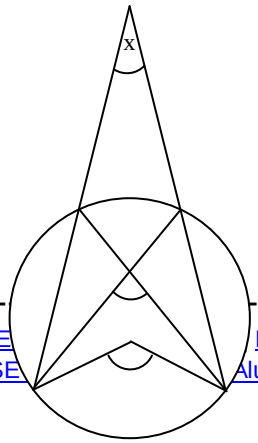
22. The mean of the following data is 38.7. Find the missing frequencies f_1 and f_2.

Classes	0–10	10–20	20–30	30–40	40–50	50–60	60–70	Total
Frequencies	5	7	f_1	3	f_2	9	6	100

23. A right triangle whose sides are 15cm and 20cm, is made to revolve about its bypotenuse. Find the volume and surface area of the double cone so formed [Use $\pi = 3.14$]

24. Prove that the degree measure of an arc of a circle is twice the angle subtended by it at any point of the alternate segment of the circle with respect to the arc.

In the given figure , O is the centre of the circle .



Prove that $\angle x + \angle y = \angle z$.

y
O
z

OR

Prove that the sum of either pair of the opposite angles of a cyclic quadrilateral is 180°.

Using the above theorem, find the angles ACD and BAC, if AB is a diameter of the circle in fig. 3.

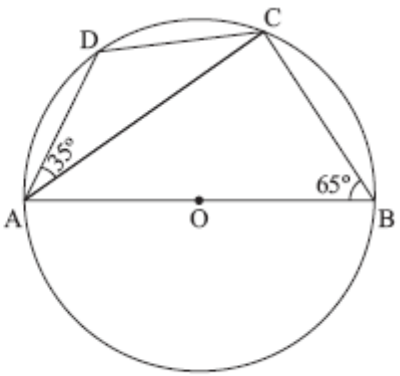


Fig. 3

25. The ratio of an areas of two similar triangles is equal to the ratio of squares of their corresponding sides.

Using the above

Prove that the area of equilateral triangle described on the side of a square is half the area of the equilateral triangle described on its diagonal.

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If you face any problem while solving this paper or at any time during your preparation, you can contact me .

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ALL THE BEST FOR YOUR EXAMS!!!!

Wish you a very Happy New Year, May this new year bring all the joy and SUCCESS in your life.