SAMPLE PAPER MATHEMATICS
CLASS - X

Max. Marks- 80 Time – 3 hours

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 Calculators is not permissible. However you may ask for mathematical tables***

SECTION - A

1. Solve the following system of equations

$$\frac{3}{x+y} + \frac{2}{x-y} = 2 \quad , \quad \frac{9}{x+y} - \frac{4}{x-y} = 1$$

OR

Solve the following system of linear equations for x and y

$x/a + y/b = 2$, $ax — by = a2-b2$

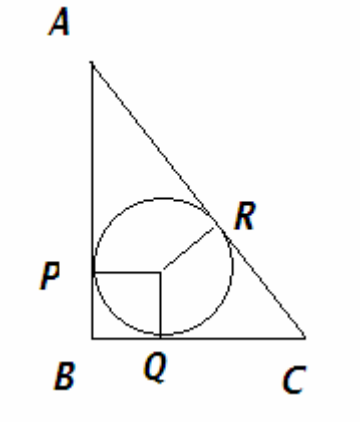
2. The LCM and GCD of two polynomials P(x) and Q(x) are $2(x^4-1)$ and $(x+1)(x^2+1)$ respectively .If $P(x) = x^3+x^2+x+1$, Find Q(x)

3. Solve the following quadratic equation for x

$(a+b)^2x^2 — 4abx – (a — b)^2 = 0$

4. The third term of an AP is 7 and the seventh term exceeds three times the third term by 2 . Find the first term and common difference and form an AP

5. A computer is available for Rs 39300 cash or for Rs 12820 cash down payment and three equal half yearly installments .If the dealer charges interest at the rate of 20% per annum compounded semi annually , Calculate each installment



6. If triangle ABC is similar to triangle DEF such that BC = 3cm , EF = 4cm and area of triangle ABC = 54cm^2 . Determine the area of triangle DEF
   OR
   Prove that a cyclic parallelogram is a rectangle
7. 17 cards numbered 1,2 ,3 -------,17 are put in a box and mixed thoroughly .One person draws a card from the box .Find the probability that the number on the card is
   (a) divisible by 3 and 2 both (b) odd

SECTION - B

8. Solve the following system linear equations graphically
   3x—4y = 12 , 2x+y- 2 = 0 , Also find the coordinates of the points where the lines meet the X axis

9. Express the following expression as a rational expression in its lowest terms
   $\frac{x^4-8x}{2x^2+5x-3} \times \frac{2x-1}{x^2+2x+4} \times \frac{x+3}{x^2-2x}$

10. A person on tour has Rs 360 for his expenses .If he extends his tour for 4 days , he has to cut
    down his daily expenses by Rs 3 .Find the original duration of the tour

11. Find the sum of all three digit numbers each of which leave the remainder 3 when divided by 5
    OR
    Howmany terms of the series 54 , 51 , 48 , --------be taken so that their sum is 513 ? Explain t

The double answer

12 . A gas cooking range is available for Rs 2500 cash or Rs 520 cash down payment followed by
4 equal monthly installments .If the rate of interst charged is 25% per annum , Calculate the
monthly installment.

13. In figure ABC is a right triangle right angled at B such that BC = 6 cm and AB = 8cm .Find
the radius of its in circle

14. Construct a quadrilateral ABCD , with <A = 45 , AB = 5.1 cm , AC = 6 cm , AD = 4.2cm
and BC = 3.6cm .Construct a quadrilateral ABCD such that its diagonal AC' = 8 cm

15. Show that $(1+\tan A \tan B)^2 + (\tan A - \tan B)^2 = \sec^2 A \sec^2 B$
OR
Without Using trigonometric tables , find the value of
sin31 .sec59 + tan 67 + sin225 +cos265

16.Prove that the points (-2,-1) ,(1,0) ,(4,3) and (1,2) are the vertices of parallelogram .Is it a
rectangle

17.A hemispherical bowl of internal diameter 36cm contains liquid .This liquid is to be filled
in cylindrical bottles of radius 3cm and height 6cm .Howmany bottles are required to empty
bowl

18.If two vertices of an equilateral triangle be (0,0) ,(3 , $\sqrt{3}$) , find the third vertex

19.Mukesh's monthly salary is Rs18000.He plans his budget for a month as given below

Item	Food	Rent	Education	Savings	Misc	Total
Amount(Rs)	5250	3500	3250	4000	200	18000

SECTION - C

20. Monthly income of Mrs. Saritha , who is a Senior citizen is Rs35000 . She donates Rs 25000
Prime Minister's Relief Fund (100% exemption) and Rs 20000 to a charitable

society

(50% exemption) .She contributes Rs 60000 towards PPF annually and pays a quarterly

premium of Rs 4500 towards life insurance .She also purchases NSC's for Rs 30000 .Find

the amount she has to pay towards income tax for the financial year

Use the follwing for calculating income tax

(a) Savings : 100% exemption for Savings up to Rs 100000

(b) Rate of Income Tax for Senior Citizen :

Slab	Income Tax
Up to 185000	No tax
From 185000 to Rs 250000	20% of the taxable income above Rs 185000
Above Rs 250000	Rs 13000+ 30% of the income exceeding Rs 250000

(c) Education Cess : 2 % of the income tax

21.Prove that in a right triangle , the square of the hypotenuse is equal to the sum of the squares

of the other two sides .

Use the above theorem , To prove that

$PR^2 = PQ^2 + QR^2 - 2\ QM\ .QR$

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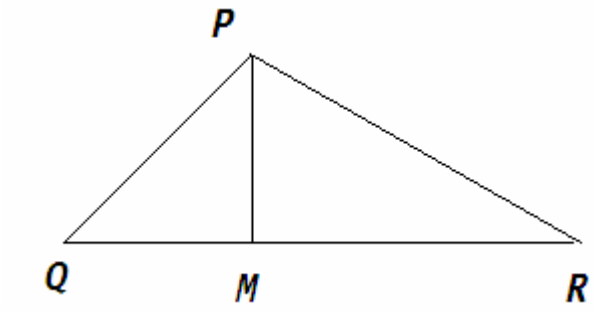
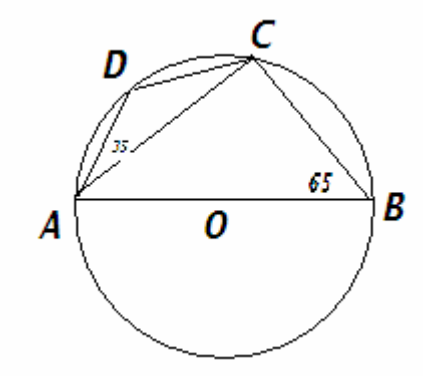


OR

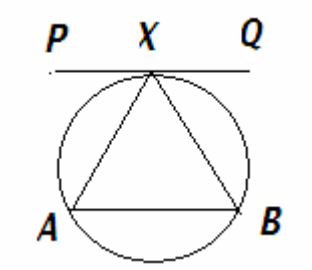
Prove that the sum of either pair of the opposite angles of a cyclic quadrilateral is 180

Using the above theorem , find the angles ACD and BAC ,If AB is a diameter of the

circle in the figure



22. If a line touches a circle and from the point of contact , a chord is drawn , show that the angles which the chord makes with the given line are respectively equal to the angles formed in the corresponding alternate segment .
Using the above theorem ,in fig PQ II AB , Given PQ is a tangent to the circle at X , Prove that XA = XB



23.Find the mean marks of the students of the following data

Marks	Below 20	Below 40	Below 60	Below 80	Below 100
No of students	10	30	45	75	80

24. From the top of a hill , the angles of depression of two consecutive kilometer stones due east are found to be 30 and 45 .Find the height of the hill

OR

A person standing on the banks of a river observes that the angle of elevation of the top of the tree standing on the opposite bank is 60 . When he moves 40 m away from the bank , he finds that the angle of elevation to be 30 . Find the height of the tree and width of the river

25.A tent is of the shape of a right circular cylinder upto a height of 3m and then becomes a right circular cone with a maximum height of 13.5 m above the ground .Calculate the

cost of painting the inner side of the tent at the rate of Rs 2 per square metre, if the radius
of the base is 14m .