## Pre - model   Examination

Class: X

Score :80

**Time: 2.30 hrs**

Mathematics

I. *Part A*   **(Answer any 4 questions. Each question carries 1 score)   (1 x 4 = 4)**

1. What is the common difference of the Arithmetic sequence
   -6, - 2, 2,.... ?
       (4, - 4, 2, - 2)

2. In the figure 'O' is the centre of the circle. <B = 70°,
   Find <D?
       (35° , 140° , 110° , 100°)

3. Which is the point on the Y-axis?
       (1 , 1) , (0 , 1) , (1 , 0) , (-1 , 0)

4. One is asked to say a natural number less than 10. What is the probability of it
   being an odd number ?

5. What is the slant height of a cone made by rolling up a semicircle of diameter
   10cm.

6. Write the polynomial $p(x)=x^2-9$ as the product of two first degree polynomials.
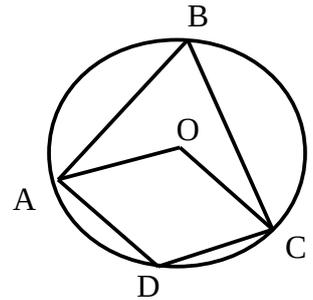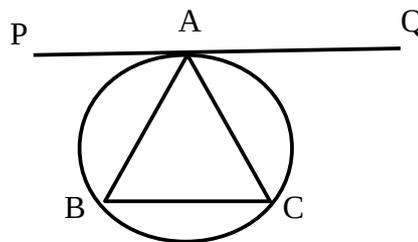
*Part B (*Answer all questions. Each question carries 1 score*)   (1 x 4 = 4)**

7. One of the end points of the diameter of a circle with centre (4,6) is (2,3). Find
   the   coordinates of the other end of the diameter.
       { (6, 9) ,(2 ,3) ,(0,0) , (6 ,4)}

8. In the figure , if   SinA = 4/5 , what is the length of AB
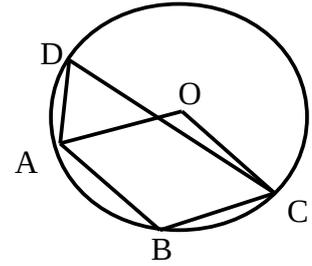   [4 cm, 5 cm , 3 cm , 2 cm]
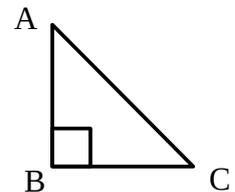
9. In the figure Δ ABC is an
   equilateral triangle. Find <PAB.

10. The base area of a square pyramid is 100 sq.cm and height is 12 cm. What is the
    slant height ?

II. *Part A* (Answer any 3 questions. Each question carries 2 scores) (2 x 3 = 6)

11. A,B,C,D are the points on the circle with centre O.
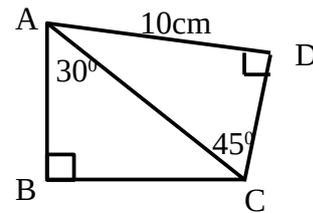   If <D = 50°
    a) Find <AOC
    b) Find <ABC

12. ABCD is a rectangle, P is the midpoint of CD. If we put a dot in the figure without looking into it.
    a) What is the probability that it would be inside the triangle APB?
    b) What is the probability that it would be inside the triangle ADP ?
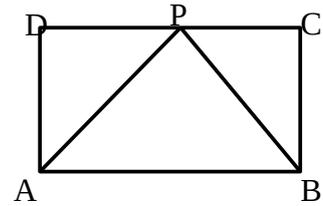
13. Find the number of all 3 digit numbers which are the multiples of 9.

14. From figure,
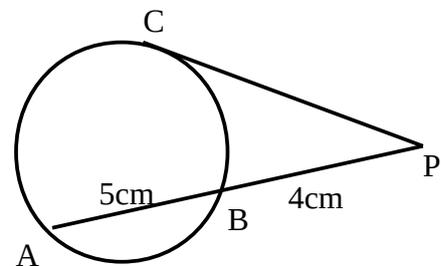   (a) Find CD
    (b) Find BC

15. Scores of 10 students are given below
    11, 25, 33, 27, 39,50, 45, 42, 48, 40
    (a) Find the Mean score
    (b)Find the Median score

Part B (Answer any 2 questions. Each question carries 2 scores) (2 x 2 = 4)

16. The equation of a circle is $(x - 1)^2 + (y - 4)^2 = 4$.
    Find the centre and radius of the circle.

17. In the figure AB is a chord extended to P and PC is a tangent. AB=5cm, PB=4cm. Find the length of PC?

18. The 11th term of an Arithmetic sequence is 33 and 17th term is 63.
    a)Find the common difference
    b) Write first term

III. *Part A* (Answer any 3 questions. Each question carries 4 scores) (4 x 3 = 12)

19. In triangle ABC , <A = 40°, <B = 80°, Circumradius of the triangle is 4 centimetre. Draw the triangle. Measure and write the length of its smallest side.

20. If x is a natural number
    a) What number is to be added to $x^2 + 6x$ to get a perfect square?
    b) If $x^2 + ax + 16$ is a perfect square , which number is 'a' ?
   c) If $x^2 + ax + b$ is a perfect square , prove that $a^2 = 4b$.

21. A sector of central angle 216° is cut out from a circle of radius 25 cm and is rolled up into a cone. What are the base radius and height of the cone ? What is its volume?

22. Draw a circle of radius 3 cm. Mark a point P 7cm away from the centre. Draw tangents from P. Measure the length of the tangents?

23. In the figure, the midpoints of the large quadrilateral are joined to the smaller quadrilateral within.
    a) Find the coordinates of the fourth vertex of the smaller quadrilateral
    b) Find the coordinates of the other three vertices of the large quadrilateral.

(3, 3)   (9, 5)

(2, 1)   (6, 2)
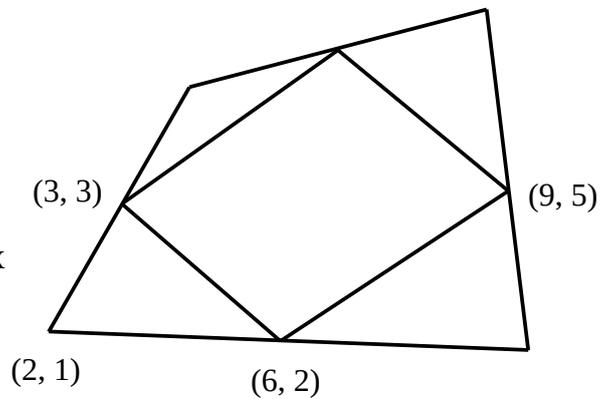
Part B (Answer any 1 question. Each question carries 4 scores)   (4 x 1 = 4)

24. A box contains 6 red beads and 5 white beads .Another box contains 8 red beads and 4 white beads .If one bead is taken from each box, then :
    (a) What is the number of possible pairs ?
    (b) What is the probability of both beads being red ?
    (c) What is the probability that both beads are white?
    (d) What is the probability of getting at least one red bead ?

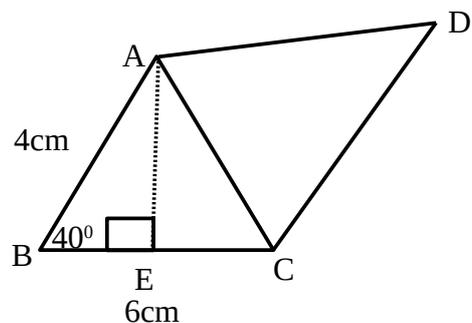25. In figure,
    AB =4cm. , BC=6cm, <B = 40°
    (a) Find AE
    (b) Find the area of ΔABC.
    (c) What is the area of the parallelogram ABCD

    A   D
    4cm
    40⁰
    B   E   C
    6cm

    (sin 40 = 0.64 , cos40 = 0.77, tan 40 = 0.84)

IV. *Part A* (Answer any 3 questions. Each question carries 6 scores) (6 x 3 = 18)

26. The shape of a top is in the form of a cone fixed over a hemi
    sphere. The radius of the hemisphere and cone is 3cm. Total
   height of the top is 15cm.

    a) How much cubic cm of wood is needed to make this?
    b) What is the total cost of painting 100 such tops,
        at 50 rupees per square centimetre?
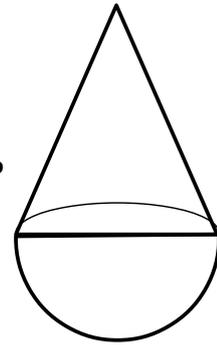
27. (a) Draw X-Y axes and mark the points A(4,4), B(3,5), C(-1,-1)
    (b) Measure the lengths AB, BC, AC.
    (c) Prove that the polygon we are getting by joining the points A, B and C is a
         right triangle

28. A boy standing on the bank of a river sees the top of a tree on the other bank at
    an elevation of 60°. Stepping 40m back, he sees it at an elevation of 30°.

    (i) Draw a rough figure based on these facts.
    (ii) Find the breadth of the river
    (iii) Find the height of the tree

29. Draw a rectangle of length 5 centimetre and width 4 centimetres. Draw a square
    having same area.

Part B (Answer any 2 questions. Each question carries 6 scores)   (6 x 2 = 12)

30. The length of a rectangular sheet
    shown in the figure is 13 cm. From
    this sheet two square sheets of   x
    maximum size are cut off. The area
    of remaining sheet is 15 sq.cm.
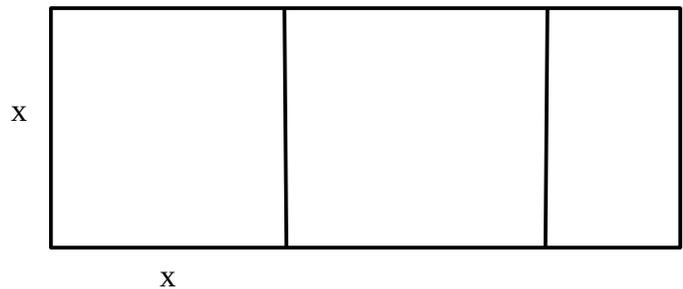
    a) If the width of the sheet is 'x' ,
        what is its breadth of the remaining sheet?
    b) Form a second degree equation , find the length and breadth of the
        remaining sheet?
    c) Find the area of the square in the figure?
    d) Find the total area of the rectangular sheet?

31. If $p(x) = x^2 – 7x + 13$,
        (a) find $p(3)$ and $p(4)$
        (b)Write the polynomial $p(x) – p(3)$ as the product of two first degree
          polynomials.
        (c) Find the solutions of the equation $p(x) – p(3)=0$

32. The table below shows the children of a class sorted according to their heights.

| Height(cm)	No. of children
120-130	7
130-140	9
140-150	10
150-160	10
160-170	9
Total	45

    If we arrange the children from the one with the least height to the one with the greatest, then
        (a) The height of the child at what position is taken as the median ?
        (b) What will be the assumed height of the 17th student?
        (c) Find the median height.

V. Answer any 2 questions. Each question carries 8 scores   (8 x 2 = 16)

33. The Algebraic form of an Arithmetic sequence is $3n + 5$.
        a) Find common difference and write sequence
        b) Check whether 100 a term of this sequence
        c) Find the sum of first 20 terms of this sequence
        d) Find the difference between sums of first 20 terms and next 20 terms of
          this sequence.

34. In the figure $<PAR = 50°, <PQB = 60°$
    a) $< APR = ... $, b) $<ABC= ..... $, c) $<ACB= ..... $, d) $<CQR= .....$
    e) Draw a circle of radius 2.5cm. Draw a triangle of
      angles 50°, 60° and 70° with its sides touching the circle.
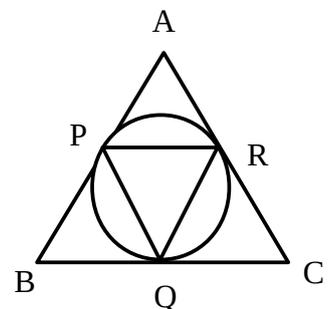
35. (3,5) and (6,7) are two points on a line.
        a) Find the slope of the line.
        b) Prove (9,9) is also a point on the same line.
        c) Find the midpoint of the line joining (3,5) and (9,9)
        d) Find the coordinates of two more points on the line.