Pages : 7

003

105 E

S.S.L.C. MODEL EXAMINATION FEBRUARY, 2011

MATHEMATICS

Time : 2½ Hrs. **Total Score : 80**

Instructions:

- Before answering each question read the instructions carefully and understand the problem.
- Answer should contain explanations wherever necessary.
- If there is an "OR" in between any two questions, answer only one among them.
- 15 minutes are given as cool off time. This time is to be used for reading and understanding the questions.

1. In an Arithmetic Progression, the 18th term is 39 and the 39th term is 18 ; then, (3)

   (i) find the common difference and first term of this progression.

   (ii) find it's nth term.

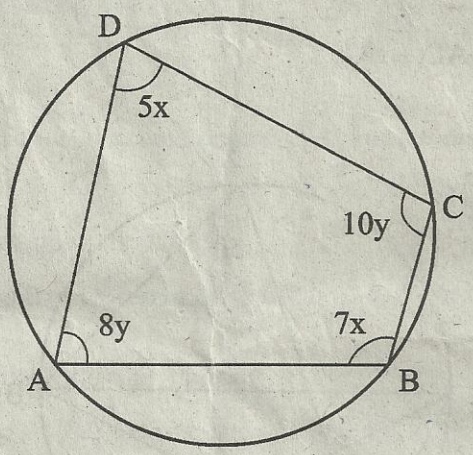
2. The distance between two numbers x and y in the number line is represented by $|x - y|$.

   Then, (3)

   (i) What is meant by $|x + 5| = 4$?

   (ii) If $|2x + 3| = |2x - 7|$, find the value of x.

3.



(3)

A B C D is cyclic quadrilateral. The measures of $\angle A$, $\angle B$, $\angle C$ and $\angle D$ are represented by 8y, 7x, 10y and 5x respectively. Then,

(i) Find the values of x and y.

(ii) Find the measures of all the angles of quadrilateral ABCD.

4. The vertices of triangle ABC are A (8, 2), B (5, –3) and C (0, 0). Then, (3)

(i) Find the length of the sides AB, BC and CA.

(ii) Kiran argues that $\triangle ABC$ is an equilateral triangle. What is your opinion? Justify your answer.

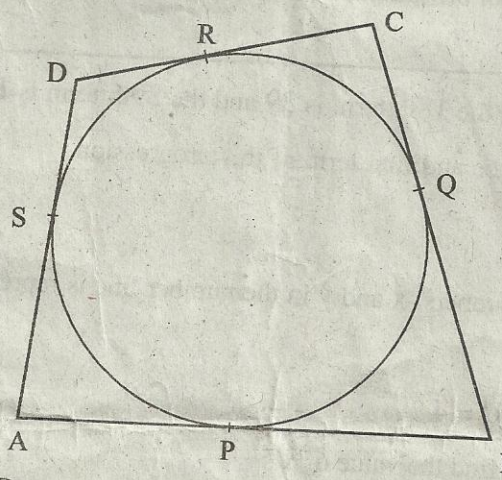
5. A cylinder of same radius and height is placed at the top of a hemisphere of same radius. Total length of the solid is 12 centimeters. (3)

(i) What is the height of the cylindrical part ?

(ii) Find the volume of the solid.

(Write the answers in the terms of π)

6. (3)

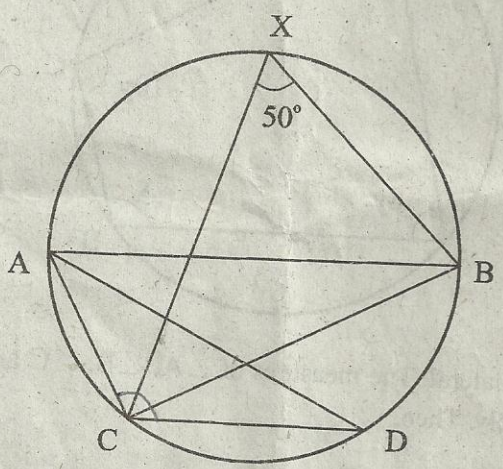


The quadrilateral ABCD touches the circle at the points P, Q, R and S.

(i) Is AP = AS ? Why ?

(ii) Prove that AB + CD = AD + BC.

7. (3)



In the figure CD is a chord parallel to the diameter AB. If $\angle C \times B = 50$, find $\angle CAB$, $\angle ABC$ and $\angle BCD$.

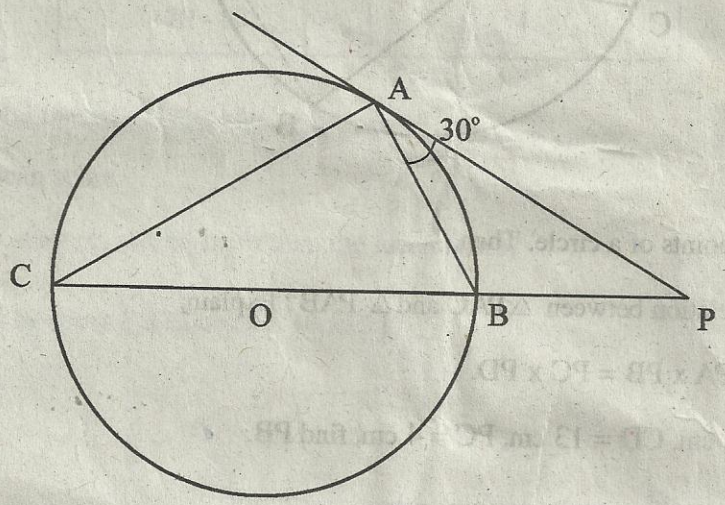
8. (4)

(i) Write the first 3 terms of the number sequences which are integers between 50 and 500 and are exactly divisible by 6.

(ii) How many numbers are there in this sequence ?

(iii) Find the sum of all numbers in this number sequence.

9. (4)



PA is tangent and AB is a chord of circle with centre O.

(i) Write the relation between $\angle PAB$ and $\angle ACB$. Justify your answer.

(ii) If $\angle PAB = 30^{\circ}$, find $\angle ABC$ and $\angle APB$.

(iii) Is BA = BP ? Why ?

10. A circle is drawn with radius 2 units and centre at –3 on the number line. The circle meets the number line at m and n. (4)

(i) Find the numbers representing m and n.

(i) For these values of m and n, represent the portion $m < x < n$ on a number line.

11. 105 soaps are arranged in the following manner: (4)

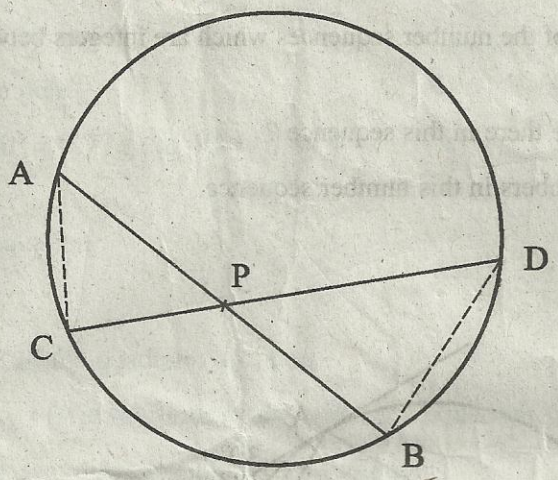
15 soaps in the bottom row, 14 in the next row, 13 in the row next to it and so on.

(i) By considering the number of soaps in each row as the terms, write a progression. Is it an arithmetic progression? Why?

(ii) As described above, in how many rows, can we arrange 105 soaps?

(iii) How many soaps are there in the top most row?

12. (4)



A, C, B, D are points of a circle. Then,

(i) Is there any relation between △PAC and△ PAB? Explain.

(ii) Prove that PA x PB = PC x PD.

(iii) If AB = 12 cm, CD = 13 cm, PC = 4 cm, find PB.

13. From a hemisphere of diameter 6 centimeters a cone of maximum volume is carved out. Then, (4)

(i) Write the radius and height of cone.

(ii) Find the volumes of hemisphere and cone. (Write the answer in term of π)

(iii) Find the ratio of their volumes.

14. The lengths of the sides of a right triangle are represented as 5x, 5x + 2, 3x - 1 Then, (5)

(i) Draw the rough figure of the right triangle and mark the given measures.

(ii) Using the above data, formulate quadratic equation.

(iii) Find the value of x.

(iv) Find the length of each side of the right triangle.

15. The following table shows the classification of scores secured by class X students of a school in a test. (5)

Scores	Number of Students
20 - 30	3
30 - 40	5
40 - 50	14
50 - 60	9
60 - 70	5
70 - 80	4

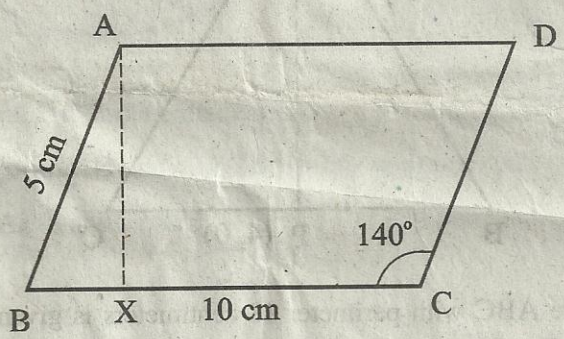
(i) Find the total number of students in the class.

(ii) Find the mean score.

(iii) How many students scored more than the mean score?

[Answer only one among the question 16 and 17]

16. (5)



In the figure ABCD is a parallelogram with AB = 5 cm, BC = 10 cm and $\angle C = 140^\circ$. AX is drawn perpendicular to BC from A.

(i) Find $\angle B$.

(ii) Find the length of AX.

(iii) Find the area of the parallelogram ABCD.

[$\sin 40^\circ = 0.64$; $\cos 40^\circ = 0.77$; $\tan 40^\circ = 0.84$]

(OR)

17. A long pole leans against a wall. The foot of pole is 3 meters away from the bottom of the wall. The pole makes an angle of 40° with the ground. (5)

(i) Draw the rough sketch and mark the given measures.

(ii) What is the height of the wall?

(iii) Find the length of the pole.

[$\sin 40^\circ = 0.64$; $\cos 40^\circ = 0.77$; $\tan 40^\circ = 0.84$]

18. Consider the quadratic equation (5)

$x^2 - 2\sqrt{3}x - 6 = 0$

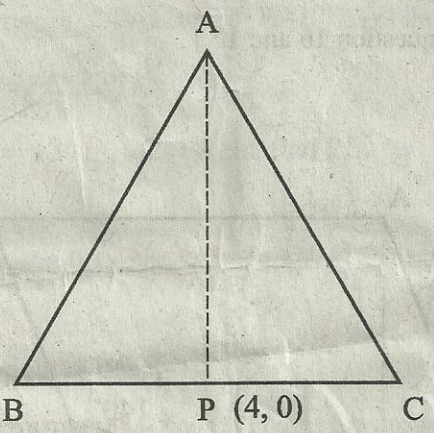
(i) Find the discriminant of the quadratic equation.

(ii) Choose the peculiarity of the solutions of this quadratic equations from the following.

[only one solution ; two distinct solutions ; no solution]

(iii) Solve the quadratic equation.

19. (5)



An equilateral triangle ABC with perimeter 18 centimeters is given in the figure. B and C are points on the x – axis. P is the mid point of BC.

(i) Find the distance of B and C from P.

(ii) Write the co-ordinates of B and C.

(iii) Find the length of AP.

(iv) Write the co-ordinates of A.

20. Draw two circles of radii 5 centimeters and 3 centimeters with the same centre O. Mark a point P on the larger circle. Draw the tangent PA from P to the smaller circle. (5)

Calculate the Lenth of PA.

Measure PA and verify your answer.

21. A tent is in the shape of a square pyramid with height 10 meters and base perimeter 192 meters. (5)

(i) What is the slant height of the tent?

(ii) Find the lateral surface area of the tent?

(iii) If the cost of 1 square meter of canvas is Rs.50, Find the cost of canvas required to make the tent.