D.A.V INSTITUTIONS
SEEMANDHRA ZONE - E
PRE-BOARD EXAMINATION: 2021-22
TERM-II

Class : X
Subject: Mathematics

Date: 14-03-22
Time: 2 hr
Max. Marks: 40

General Instructions:

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. All questions are compulsory.
3. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
4. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
5. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case-study based questions.

SECTION – A

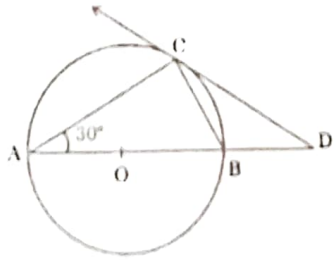
1. Find the 9^{th} term from the end of the AP.: 7, 10, 13, ..., 184

OR

The fourth term of an AP is 11. The sum of the fifth and seventh terms of the AP is 24. Find its common difference.

2. Find the values of k, such that the quadratic equation $x^2 - 2kx + (7k - 12) = 0$, has equal roots.

3. AB is a diameter of a circle with centre O and AC is its chord such that $\angle BAC = 30°$. If the tangent drawn at C intersects extended AB at D, then show that BC = BD.



4. A right circular cone made of iron is of 8 cm height and has base radius 2 cm. It is melted and recast into a sphere. Determine the radius of the sphere.

5. From the given table, find the sum of the lower limit of the median class and the upper limit of the modal class.

Class Interval	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	1	3	7	5	9	3

6. Solve for x: $2x^2 - 11x + 9 = 0$ by using quadratic formula.

OR

The present age of father is equal to the square of the age of his son. The sum of the ages of father and five times the age of son is 66 years. Find their present ages.

SECTION – B

7. The mean of the following distribution is 54. Find the missing frequency p.

Class Interval	0-20	20-40	40-60	60-80	80-100
Frequency	6	8	4	p	10

8. Draw a circle of radius 3.5 cm. Take a point P outside the circle at a distance of 7 cm from the centre of the circle and construct a pair of tangents to the circle from point P.

9. The following table shows the marks scored by 140 students in an examination. Calculate the mode of the distribution.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	8	24	40	36	20	12

10. From the top of a 7m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.

OR

Two ships are approaching a light-house from opposite directions. The angles of depression of the two ships from the top of the light-house are 30° and 45°. If the distance between the two ships is 100m, find the height of the light-house.

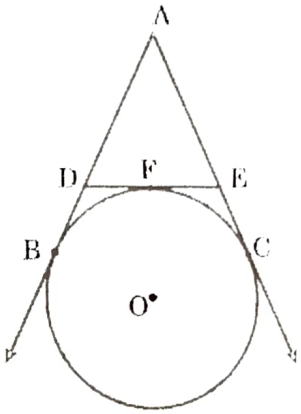
SECTION – C

11. A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 19cm and the diameter of the cylinder is 7cm. Find the volume and total surface area of the solid.

12. Prove that the parallelogram circumscribing a circle is a rhombus.

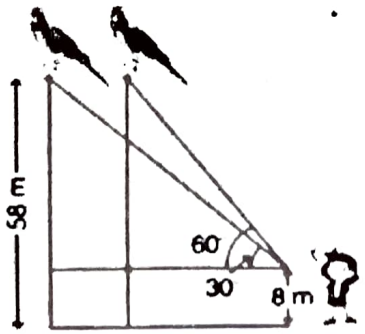
OR

In the given fig. AB and AC are two tangents to a circle from external point A. DE is a line segment touching the circle at F and intersecting AB at D and AC at E. Prove that $AB = \frac{1}{2}$ (Perimeter of ΔADE). Also find the length of OA if the length of the tangent is 12cm and radius of a circle is 5cm.



CASE STUDY-1

13. A girl 8m tall , spots a parrot sitting on the top of a building of height 58m from the ground. The angle of elevation of the parrot from the eyes of a girl at any instant is 60°. The parrot flies away horizontally in such a way that it remained at a constant height from the ground. After 8 sec ,the angle of elevation of the parrot from the same point is 30° .



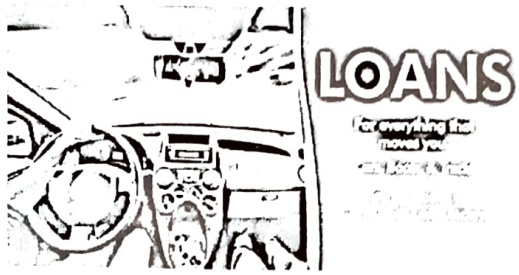
Based on the above information, answer the following:

(i) Find the distance of first position of the parrot from eyes of the girl.

(ii) Find the distance covered by the parrot.

CASE STUDY-2

14. Mr. Kumar wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs. 1,18,000 by paying every month starting with the first installment of Rs.1000 .If he increases the installment by Rs.100 every month , then answer the following:



(i) Find the amount paid by him in 30th installment.

(ii) What amount does he still have to pay after 30th installment?

****