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Ministry of Education, Higher Education and Vocational Education

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2024 (2025) - පෙරහුරු පරීක්ෂණය
General Certificate of Education (Ordinary Level Examination), 2024 (2025) – Practice Test

Mathematics - I	**32 – E I**	**Two hours**

Name/ Index Number .....

.....
Signature of Invigilator

Important:

- This paper consists of 8 pages.
- Write your Index Number correctly in the appropriate places on this page and on page three.
- Answer all questions on this paper itself.
- Use the space provided under each question for working and writing the answer.
- Indicate the relevant steps and the correct units when answering the questions.
- Marks will be awarded as follows:
  02 marks each for questions in part A.
  10 marks each for questions in part B.
- Blank papers can be obtained for scratch work.

For Marking Examiner's use only.

Question number		**Marks**
A	**1 – 25**	
B	**1**	
	2	
	3	
	4	
	5	
Total		

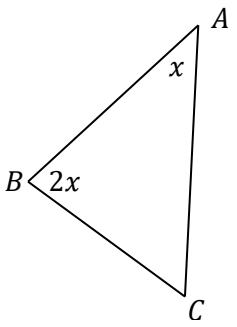
.....
Marked by

Part A

Answer all the questions on this paper itself.

(01) Vidwa deposited 6000 rupees in a bank which pays 8% annual simple interest rate. How long after does he receive 1440 rupees as the interest?

(02) In triangle ABC, $B\hat{A}C + A\hat{C}B = 100^0$. Find the value of $B\hat{A}C$ using the given information.



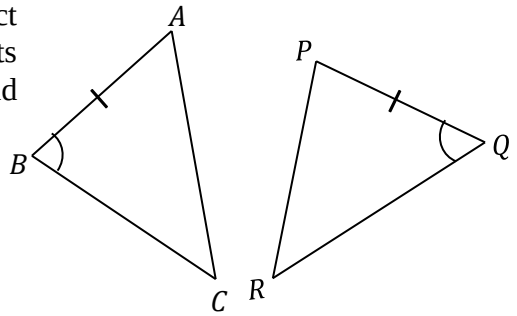
(03) Find the least common multiple of the following algebraic terms.

$x^2y, \quad 4x^2y, \quad 6xy$

(04) If $\log_5 a = 4$, express a as the power of 5.

(05) According to the information shown in the figures, select and underline the statement from the following statements that matches the remaining elements of triangles ABC and PQR to be congruent.

(i) $AC = PR$ or $A\hat{C}B = Q\hat{P}R$
(ii) $BC = QR$ or $B\hat{A}C = R\hat{P}Q$
(iii) $AC = PQ$ or $B\hat{C}A = R\hat{P}Q$



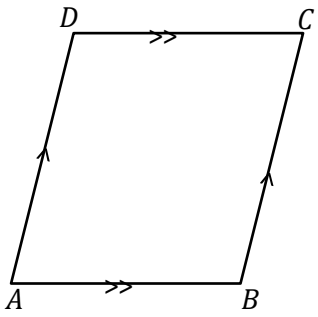
(06) Factorize : $3x^2 - 75$

(07) A sector of angle at the centre 90^0 is cut off from the circular paper whose area $154cm^2$. Find the area of that sector.

(08) $A = \{\text{Multiples of 5 below 20}\}$
Write the set A in set builder method.

(09) *ABCD* is a parallelogram. Among the statements related to this parallelogram, mark "√ " in front of the correct statements and "×" in front of the incorrect statements.

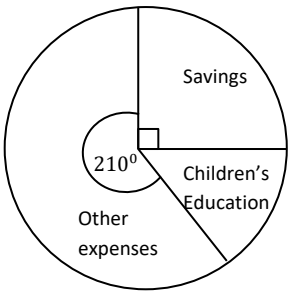
Statement	"√ " or "×"
(i) $AB = DC$	
(ii) $AC = BD$	
(iii) $D\hat{A}B = D\hat{C}B$	



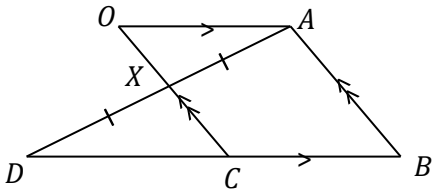
(10) The selling price of an imported electric item is 80 000 rupees. A value added tax (VAT) of 15% is payable on the purchase of the product. Find the value of the product including taxes.

(11) Solve : $\frac{1}{x} - 2 = \frac{1}{2}$

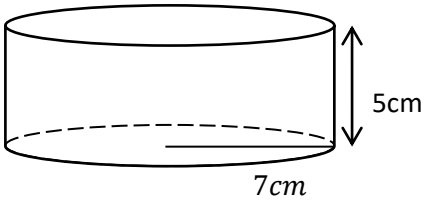
(12) The below pie chart shows how a person spends his monthly income. If an amount of 30 000 rupees is separated for savings, how much is separated for children's education?



(13) The mid-point of the line AD is X. DCB is a straight line and $OABC$ is a parallelogram. If $OA = 5cm$ find the length of BD.

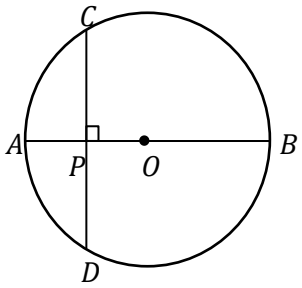


(14) The following right circular cylindrical vessel is made of thin plate without lid of radius $7\,cm$ and height $5\,cm$. Find the curved surface area of it.

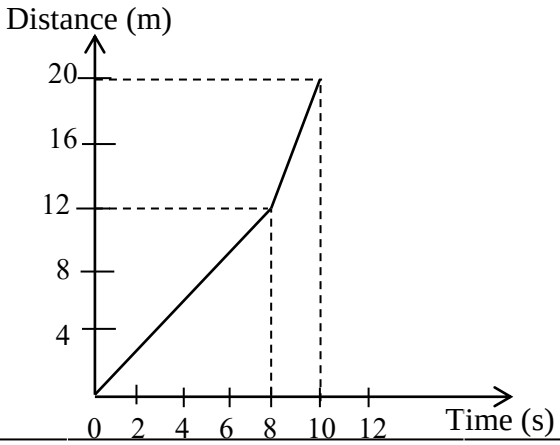


(15) Express the 4^{th} term of a geometric progression as a power of 10 with the first term 8 and the common ratio 5.

(16) AB is drawn perpendicular to CD in the circle with centre O. If $AB = 10\,cm$ and $CD = 8\,cm$ find the perpendicular distance from O to CD.

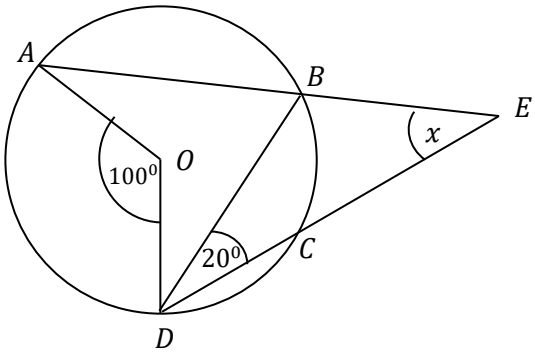


(17) The following distance-time graph shows how a person doing daily exercise within 10 seconds. Find the average speed of the motion.

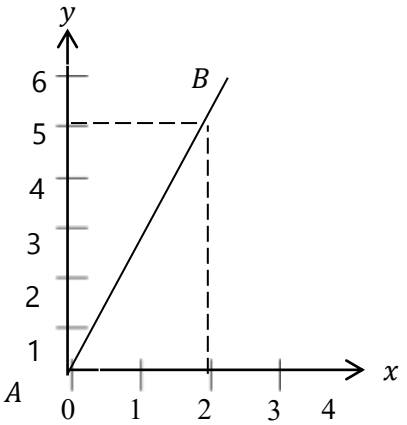


(18) Find the maximum integer that satisfy the inequality $3x + 2 < 8$.

(19) The centre of the circle is O and the points A, B, C, D are lie on the circle. Find the value of x using the given information.



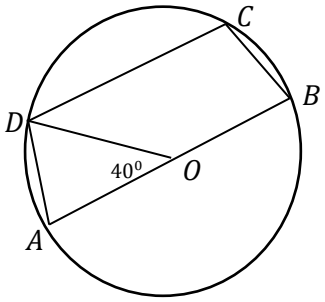
(20) Find the equation of the straight line AB in the given figure.



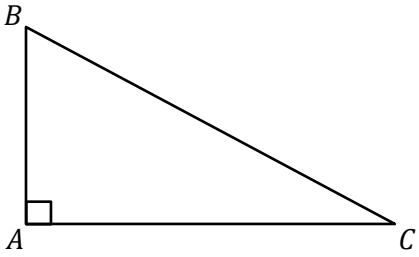
(21) The following tables show the information obtained by measuring the mass of several packets of sugar and dhal whose mass was recorded as 1 kg. Find the probability that a randomly selected packet from this sample has a mass less than 1 kg.

Item	More than 1 kg	Less than 1 kg
Sugar packets	27	23
Dhal packets	19	31

(22) In the given circle the centre is O and AOB is a diameter. The points C and D are lie on the circle. If $A\hat{O}D = 40^0$ find the value of $B\hat{C}D$.

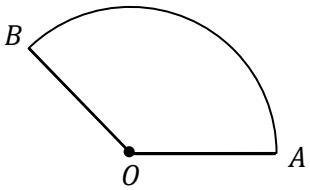


(23) A person at the top B of 20 m height vertical building AB sees a point C on the horizontal plane with an angle of depression 40^0. Mark the given information in the figure.



(24) If $A = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ and $B = (1 \; -1)$ find the matrix AB.

(25) OAB is a sector which is cut from the circular plate with centre O. A point P should be marked on the arc AB which is equidistant to the two points A and O. Mark the point P using the knowledge of loci.



Part B

Answer all the questions on this paper itself.

(01) $\frac{2}{7}$ of the daily broadcast time of a television channel is allocated to educational programs. $\frac{1}{3}$ is allocated to children's programs and $\frac{5}{8}$ of the remaining time is allocated to documentary programs.

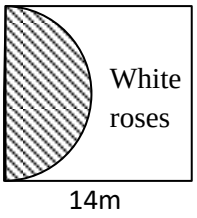
i. Express the time allocated to the educational and children's programs as a fraction of the daily broadcast time.

ii. Express the time allocated to the documentary program as a fraction of the daily broadcast time.

iii. If extra 2 hours are allocated to children's programs than the documentary programs, find the total daily broadcasting time.

iv. Find the daily broadcast time is allocated for the advertisements after the time allocated for the above three programmes.

(02) In the square-shaped plot of land 14 m in length of side, red rose plants are grown in a semi-circular portion whose diameter as the side of the square. White rose plants are grown in the remaining part of the land.



(i) Find the radius of the plot where red rose plants were grown.

(ii) Find the area of the plot where the red rose plants were grown.

(iii) A fence is constructed (along each border) in the plot where rose plants are grown. Find the length of that fence.

(iv) As the section where red roses are planted is in a rectangular shape, it is intended to remove the white rose plants from a part of $21m^2$ where white roses are grown and plant red roses there as well. Draw the total area proposed to grow red rose on the diagram with measurements.

(v) Find the length reduced from the fence if it is restricted after the above mentions change.

(03) Mr. Samantha deposits 200 000 rupees in a bank for 2 years at an annual compound interest rate of 12%.

(i) What is the total amount he receives after two years?

He keeps 10 880 rupees from that amount for his needs and the balance he invests to buy the shares from a certain company as 40 rupees per share.

(ii) Find the number of shares he bought.

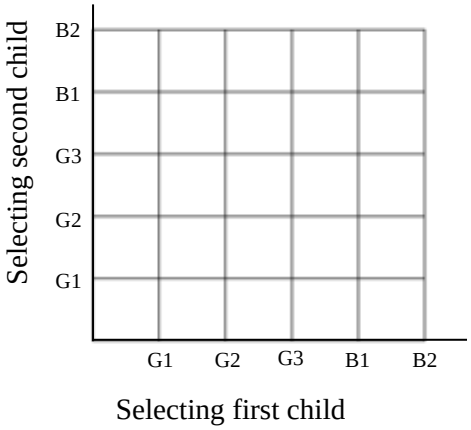
(iii) If he received 48 000 rupees as the annual dividend, find the dividend per share.

(iv) If he gained 90 000 rupees as the capital gain by selling all the shares, find the selling price of a share.

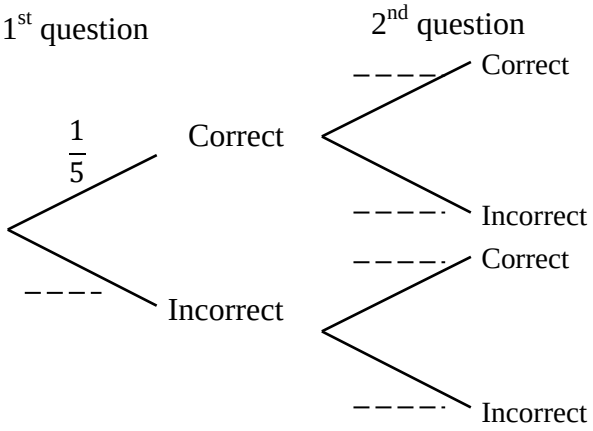
(04) (a) The teacher in charge of chess team decided that select the two children randomly from a group of three girls and two boys for school chess team.

(i) Mark the sample space in which the two children can be selected with "x" on the given grid.

(ii) Encircle and write the probability that the two children selected are two boys or two girls. (Here G1, G2, G3 represent girls and B1, B2 represent boys)



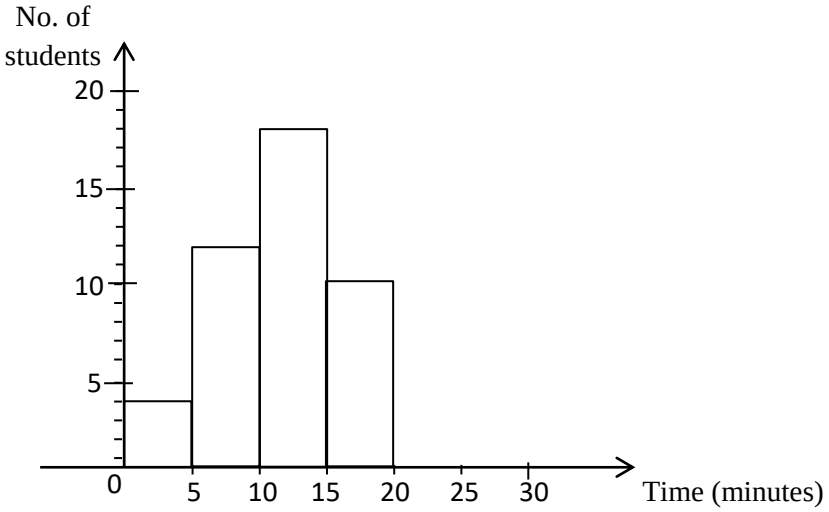
(b) The following incomplete tree diagram show the correctness or incorrectness of the answers when a candidate randomly answers 2 multiple choice questions out of 5 choices and the answer is unknown in a competitive examination.



(i) Fill in the blanks of the above tree diagram.

(ii) Find the probability that the answer given by that candidate for only one question is correct.

(05) The following incomplete histogram shows the information about the time, the group of students waited for a bus to arrive at a bus halt to go home after school.



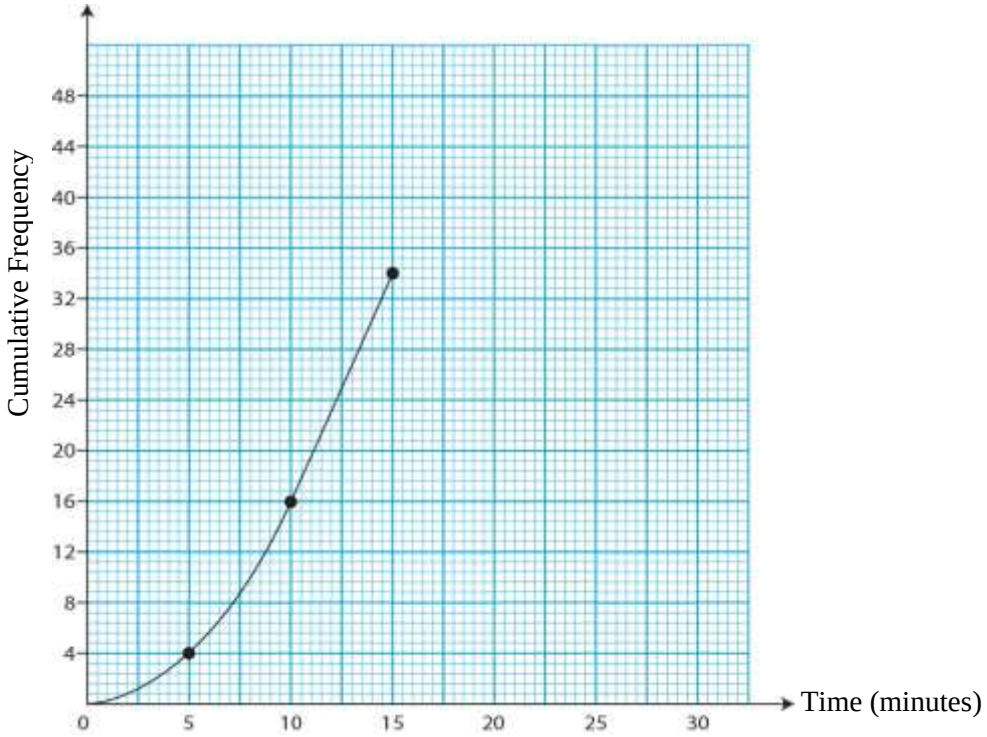
(i) If four students stayed at the bus station for 20 – 30 minutes, using this information complete the histogram.

(ii) Draw the frequency polygon on the completed histogram.

(iii) Complete the following frequency distribution using the above completed histogram in (i).

Time (minutes)	0 - 5	5 - 10	10 - 15	15 - 20	20 - 30
No. of students	04	12	18		04

(iv) Using the above completed frequency distribution in (iii), complete the cumulative frequency curve.



(v) Find the median time a student waited at the bus station until a bus arrived using the cumulative frequency curve.

Ministry of Education, Higher Education and Vocational Education
General Certificate of Education (Ord. Level Examination), 2024 (2025) – Practice Test

Mathematics - II	32 – E II	Three hours

Additional Reading Time – 10 minutes
Use additional reading time to go through the question paper, select the questions and decide on the questions that you give priority to in answering.

Instructions :

- Answer **ten questions** selecting **five questions** from **Part A** and **five questions** from **Part B**.
- Each question carries 10 marks and this paper carries 100 marks.
- The volume of a right circular cylinder of base radius r is $\pi r^2 h$.

Part A
Answer only 5 questions.

1. y is a quadratic function of x. Following is a table containing corresponding values of y for several x values in the range of $-4 \leq x \leq 2$.

x	-4	-3	-2	-1	0	1	2
y	5	0	-3	-4	-3	0	5

(a) Using the standard system of axes and a suitable scale, draw the graph of the quadratic function according to the above table.

(b) Using your graph,

i. Write the coordinates of the turning point.

ii. Find the range of x where the function is decreasing in the range of $-3.5 \leq y \leq 5$.

iii. Express the function in the form of $y = (x + a)(x + b)$. (Here a and b are integers)

iv. Write the function obtained when the above function is displaced 4 units vertically upwards.

2. In a voluntary organization in the year 2024, the number of male members was 15 more than the number of female members. In 2025, during the recruitment of new members, number of males equal to half of three times the previous male membership and a number of females equal to the previous female membership were newly recruited, making the total membership of the organization 150.

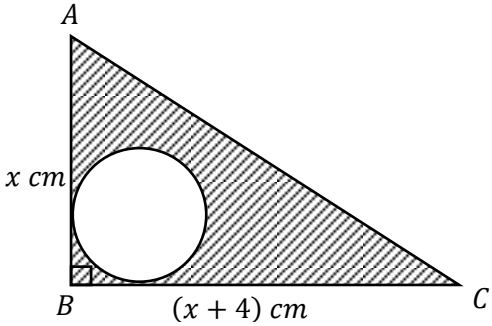
i. By taking the number of male members in the year 2024 as x and the number of female members as$y$, construct the pair of simultaneous equations.

ii. Solve the above equations and find the number of male members and female members of the organization in the year 2024.

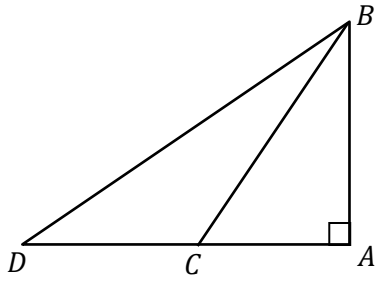
iii. Show that the number of male members in the organization is twice the number of female members after recruiting new members.

3. The value of an electric motor bicycle is 360 000 rupees. It can be purchased by paying $\frac{2}{3}$ of its value initially and the balance can be settled in 24 equal monthly installments of 6875 rupees each. If the interest is calculated in the method of reducing balance, calculate the annual interest rate charged.

4. The shaded area of the figure is 11.84 cm^2. The length of AB is $x\ cm$, that of BC is $(x + 4)\ cm$. If the radius of the circle is 1.4 cm, construct a quadratic equation by using the above data and find the length of BC to the nearest first decimal place. (Take $\pi = \frac{22}{7}, \sqrt{10} = 3.16$)



5. The bottom of the vertical post AB is A. A wire of 34 m long which is tied to a point C on the ground from the top of the post makes an angle of 54^0 with the ground. The points A, C and D are collinear.



   i. Copy the diagram on to your answer script and include the given data.
   ii. Find the height of the post to the nearest first decimal place by using the trigonometric tables.
   iii. Show that the angle of elevation to the top of the post observed by Kumudu from point D which is 25 m away from C along AC is greater than 30^0. (Neglect the height of the observer)

6. Following frequency distribution shows the information about the amount of certain type of rice bought by the people living in a housing complex from its Super market.

Class intervals Monthly consumption (kg)	16-20	21-25	26-30	31-35	36-40	41-45
No. of houses	5	8	18	10	6	3

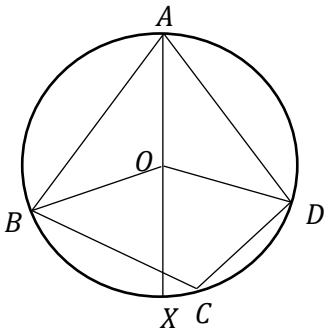
   i. Write the class interval that contains the quantity of rice purchased by the highest number of residents for consumption in a month.
   ii. Find the mean of monthly consumption of rice in a household to the nearest kilogram.
   iii. If the price of $1kg$ of the above type of rice is 240 rupees, show that the expected monthly income from the sale of this rice at the supermarket exceeds 345 000 rupees.
   iv. It the government imposes a controlled price for the above type of rice at 220 rupees, calculate the minimum amount of money that can be saved by a resident who consume more than $35kg$ per month.

Part B
Answer only 5 questions.

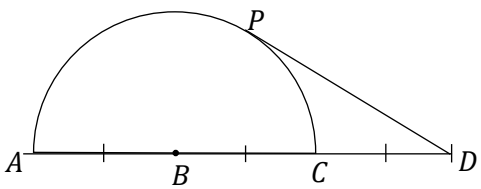
7. In a botanical garden, flower baskets are arranged in several layers within a steel frame. In the bottom layer, there are 100 flower baskets, and in each subsequent layer, the number of pots decreases by 7 from the layer directly below it.
   i. Write the number of flower baskets in the first four layers, starting from the bottom.
   ii. How many flower baskets in the 10^{th} row from the bottom?
   iii. If there are 2 flower baskets in the topmost layer, how many layers of flower baskets are there in the steel frame?
   iv. Show that the total number of flower baskets in the layers where the baskets in an even number exceeds the total number of flower baskets in the layers where the baskets is an odd number by 50.

8. Use only a straight edge with a cm/mm scale and a pair of compasses for the following geometric constructions. The construction lines should be drawn clearly.
   i. Construct the triangle ABC such that $AB = 4.5\ cm,\ BC = 6.2\ cm$ and $A\hat{B}C = 120^0$.
   ii. Mark the point D which is equidistant to AB and BC, and $AD = 5\ cm$, then complete the quadrilateral $ABCD$.
   iii. Construct the circle which goes through A, D and C and name the center as O.
   iv. Produce CO and name the point of intersection it with circle as E and construct a tangent to the circle at E.

9. (a) The points A, B, C and D are lie on the circle with center O.
   $AB = AD$ and produced AO meets the circle at X.
   Prove that $D\hat{O}X + B\hat{C}D = 180^0$.

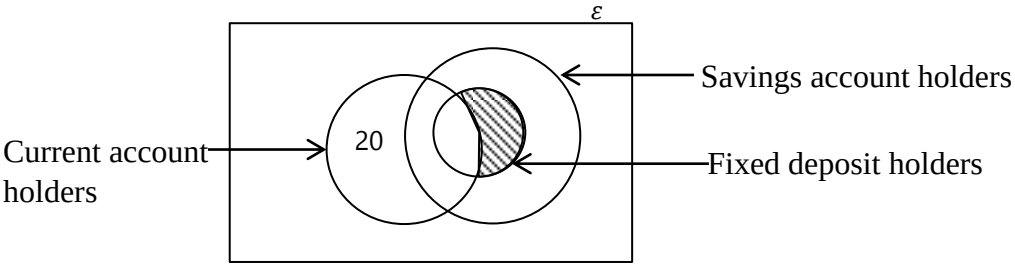


   b) The points B and C are marked on the straight line AD such that $AB = BC = CD$.
   The tangent DP is drawn to the semicircle at the point P.
   Show that $C\hat{A}P = 30^0$.



10. A solid metal prism of cross sectional area $24\ cm^2$ and length $9\ cm$ is melted and makes 10 solid right cylinders of radius $r\ cm$ and height $3r\ cm$. Then the remaining volume of metal is $18\pi r^3$, show that $r = \sqrt[3]{\frac{9}{2\pi}}$. By taking the value of $\pi = 3.14$, find the value of r to nearest first decimal place.

11. Given below is an incomplete Venn diagram drawn to represent the types of accounts maintained by 100 customers of a certain bank.



- There are 50 customers having only one type of accounts.

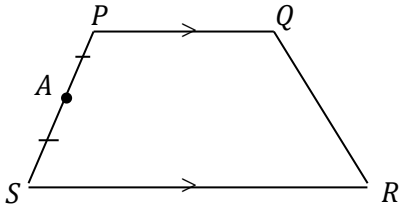
i. If the number of customers having all three types of accounts is exactly half of the customers having only savings accounts, how many customers have all three types of accounts?

ii. If there are 45 customers have current accounts, how many customers have only current accounts and savings accounts?

iii. There are 8 customers who do not have any of the above accounts. How many customers belong to the shaded region in the Venn diagram? Describe that region in words.

iv. The customers who have only current accounts and three customers who do not have any of the above accounts, decided to open savings accounts. Draw a new Venn diagram and include that information.

12. The midpoint of the side PS of the trapezium $PQRS$ is A. Produced QA and RS meet at T.



i. Copy the given diagram to your answer sheet and include the given data. Join PT.

ii. Prove that the triangle TQR and trapezium $PQRS$ are equal in area.

iii. Show that the area of the triangle PQR = area of the triangle QST.

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