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32 S I

Dehiowita Education Zone

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දෙවන වාර පරීක්ෂණය - 2024

2nd Term Test - 2024

ගණිතය I

கணிதம் 'I'

Mathematics I

පැය දෙකයි

இரண்டுமணித்தியாலம்

Two hours

Index Number:.....

Certified Correct

.....
Signature of Invigilator

Important :

- * This question 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 are awarded as follows:
In Part A
2 marks for each question
In Part B
10 marks for each question
- * Blank papers can be obtained for scratch work.

For Marking Examiner's Use Only

Part	Question number	Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		
.....
First Examiner	Code Number	
.....
Second Examiner	Code Number	
.....
Arithmetic Checker	Code Number	
.....
Chief Examiner	Code Number	

Part A

Answer all the questions in the paper itself.

1. Between which pair of whole numbers does the value of $\sqrt{54}$ lie?

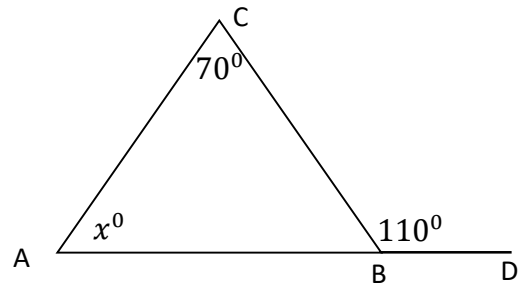
2. Solve $\frac{x}{5} + 3 = 5$

3. Express $\log_5 125 = 3$ in index notation.

4. Fill in the blanks

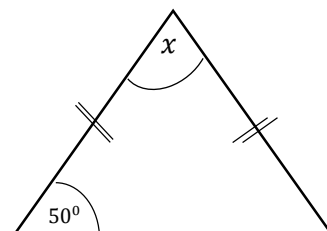
$$x^2 + \dots x - 28 = (x + \dots)(x - 4)$$

5. Find the value of x .

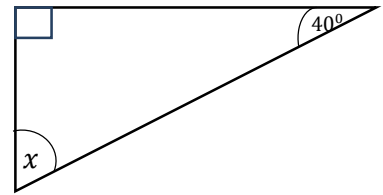


6. The area of a circular lamina is $88m^2$. Find the area of a sector with a central angle of 90° , which is cut off from the above circle.

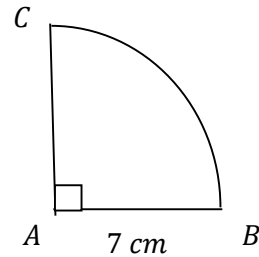
7. Find the value of x .



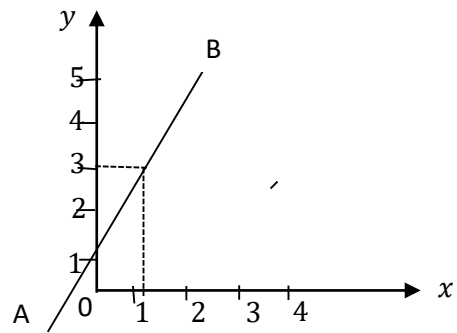
8. Find the value of x .



9. Calculate the arc length of BC of the given sector.

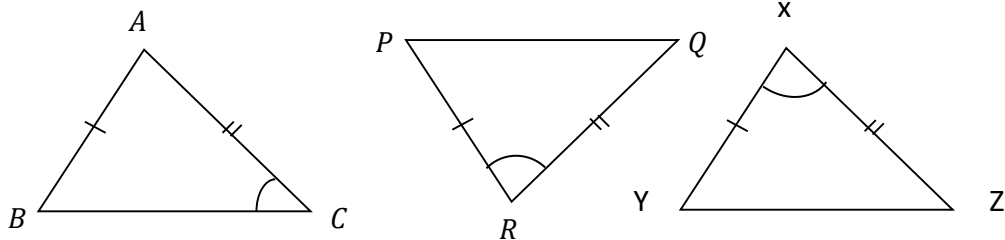


10. Write the equation of the straight line AB given on the Cartesian plane.



11. $A = \{x; x \text{ is a prime number } 1 < x < 20\}$ Write the set A in terms of its elements.

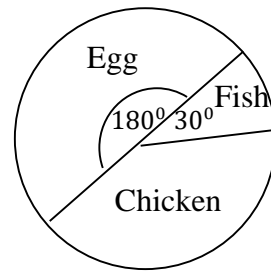
12 Name the pair of congruent triangles and state the case of congruency.



13. It took 20 minutes to completely fill an empty tank using a pump through which water flows at a uniform rate of 20 liters per minute. Find the capacity of the tank.

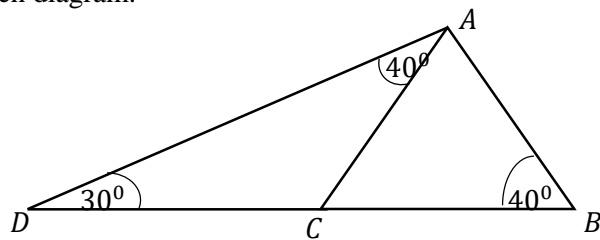
14! 5 men will take 6 days to complete a certain task. How many men should be engaged to complete the task in 3 days?

15. According to the pie chart given below, 60 people prefer eggs. How many people prefer chicken?

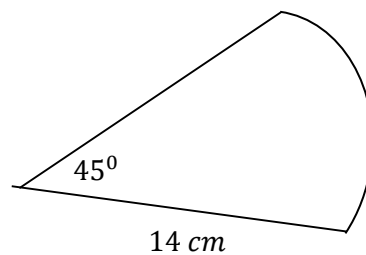


16. Simplify $\frac{1}{a} + \frac{2}{3a}$

17. Name a pair of sides equal in length in the given diagram.



18. Find the area of the sector given below.



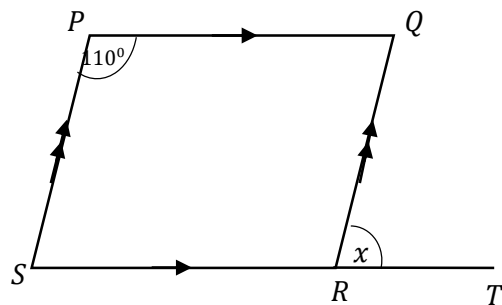
19. Simplify $\frac{3}{5} \div 1\frac{1}{2}$

20. Solve $x(x - 3) = 0$

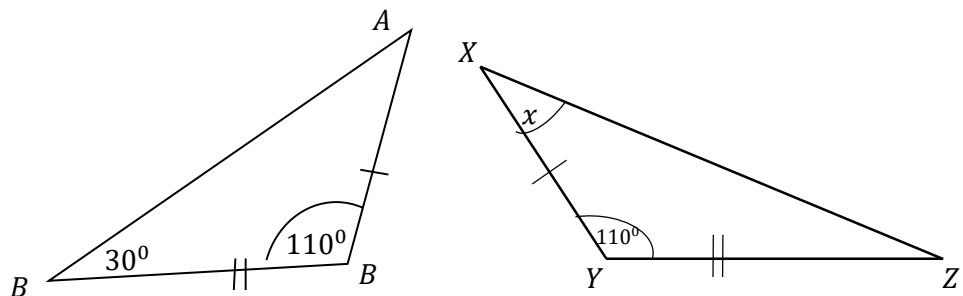
21. The assessed annual value of a shop is RS. 120 000. If the relevant provincial council charges 8% of the assessed value as rates, calculate the rates that must be paid in a quarter.

22. Find the least common multiple of $12xy^2$, $9x^3y$.

23. Find the value of x .



24. According to the information given in the triangle find the value of x .



25. Put a (✓) against the correct statement.

A quadrilateral in which the opposite angles are equal is a parallelogram.	
A quadrilateral in which only one pair of opposites are equal is a parallelogram	
A quadrilateral in which the diagonals bisect each other is a parallelogram.	



Part B

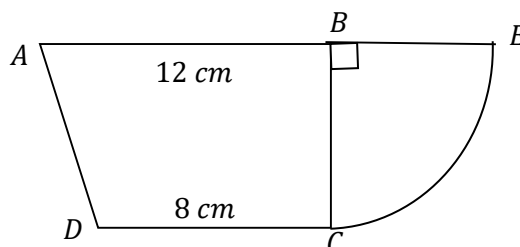
Answer all the questions in the paper itself.

- 1) A cultivator allocates $\frac{3}{7}$ of his land for vegetable cultivation and $\frac{3}{8}$ of the remaining land for fruit cultivation.

- (i) What fraction of the total land is remaining after vegetable cultivation?
- (ii) What fraction of the total extent is not under fruit cultivation?
- (iii) What extent of the land is allocated for both vegetable and fruit cultivation?
- (iv) Due to a certain emergency, the land owner intends to sell the land that is not being cultivated at 300 000 rupees. Accordingly, find the value of the whole land.

10

- 2) The figure depicts a part which is cut off from a plate. ABCD is a trapezium and BCE is a sector. AB = 12cm, DC = 8cm and BC is the perpendicular distance between AB and DC.



- (i) If the area of the trapezium ABCD is 70cm^2 , find the length of BC.
- (ii) If $AD = 9.5\text{cm}$, find the perimeter of the plate.
- (iii) The plate must be cut along a line parallel to AD through C. Mark the point P at which the parallel cut meets the AB edge. Find the remaining PEC area after removing the part APCD.
- (iv) Find the length of the CX side of the triangular segment PCX which is equal in area to the segment APCD to be removed and draw it with measurements in the above figure. (extended X lie on CD)

10

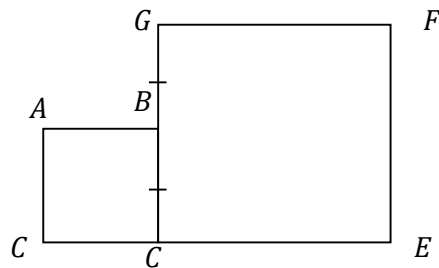
- 3) a. It has been estimated that 8 men will take 7 days to clear a garden.
 (i) What is the magnitude of the task in man-days?

Three men had to leave after working for two days due to an illness.

- (ii) What is the magnitude of the remaining task in man-days?

- (iii) How many more days will the remaining workers take to complete the task?

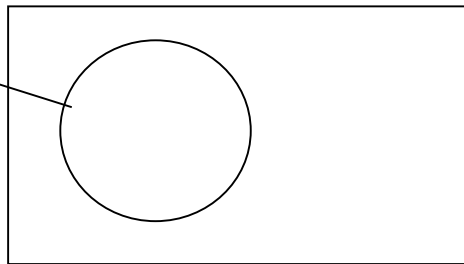
- b. If the area of the square ABCD is 45cm^2 , find the length of one side of the square CEFG for the approximation.



- 4) Gavesh gifted a pen to all 35 children in his class on his birthday. Among the pens distributed were blue, black, and red.

Given below is an incomplete Venn diagram drawn according to the above information.

Children who
received blue pens

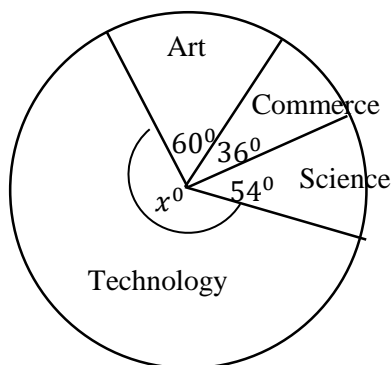


N - Children who received blue pens

K - Children who received black pens.

- (i) If 20 children did not receive blue pens how many children received blue pens?
- (ii) If $n(K) = 12$, represent the set of children who received black pens in the Venn diagram.
- (iii) Find the value of $n(N \cup K) + n(N \cap K)$
- (iv) The cost of a blue pen is RS.25, a black pen is RS.24 and a red pen is Rs.20. accordingly, what amount of money is spent on buying all the pens?

- 5) Given below is an incomplete pie chart drawn on the information of 120 students who selected their advanced level subject stream before receiving ordinary level examination results.



- (i) Find the magnitude of the angle at the center of the sector that represents the students who selected the technology.

- (ii) According to the above information fill in the blanks in the following table

Subject stream	Arts	Commerce	Science	Technology
No: of students				

- (iii) It was revealed that 10 students who chose the technology stream were admitted to the art stream. According to the new information what is the magnitude of the angle at the center of the sector that represents the arts stream?

- (iv) According to the new information how many times the number of students who selected the technology stream as the number of students who selected the arts stream?

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32 S II

Dehiowita Education Zone

10 ශ්‍රේණිය

දෙවන වාර පරීක්ෂණය - 2024

2nd Term Test - 2024

ගණිතය II

கணிதம் ;II

Mathematics II

පැය තුනයි

மூன்று மணித்தியாலம்

Three hours

අමතර කියවීමේ කාලය- මිනිත්තු 10 යි
Additional Reading Time – 10 minutes

Use the additional reading time to go through the question paper, select the questions and decide on the questions that you give priority to in answering.

Important:

- Answer **10 questions** selecting **5 questions** from **part A** and **five** questions from **part B**.
- When answering the questions write the **steps** and the **units correctly**.
- Each question is given **10 marks**

Part A

Answer only 05 questions.

1. The information about the income tax percentage that is levied in a certain year is given below.

Annual income	Income tax percentage
Initial 500 000	Tax free
Next 500 000	4%
Next 500 000	8%
Next 500 000	12%

The monthly income of a certain businessman is Rs.110 000. Expect that he receives an income of Rs.280 000 as the shop rent. Find the annual income tax he needs to pay and find what percentage of his total income is paid as income tax.

2. Given below is an incomplete table of values prepared to draw the graph of the function $y = x^2 - 5$.

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

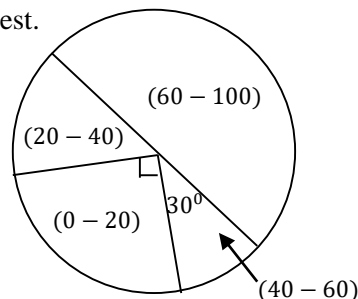
- Find the value of y when $x = 0$
- By taking a suitable scale draw the graph of the function
Using the graph,
- Find the range of values of x in which the function is decreasing negatively.
- Find the roots of the equation $x^2 - 5 = 0$
- Write down the coordinates of the turning point of the new graph obtained by shifting the above graph by 02 units upwards along the y -axis.

3. (i) Expand $(3a - 2b)^2$
(ii) Write 103^2 as a square of a binomial expression and evaluate
(iii) Find the least common multiple of $4x^2 - 1$, $3(x - 1)^2$, $2x^2 - x - 1$
(iv) Simplify $\frac{2}{2x^2 - x - 1} - \frac{1}{4x^2 - 1}$

4. It requires 40 pieces of 12cm and 20cm long iron rods to make a Vesak lantern. The total length of iron rods that is required is 608cm. Considering that no piece of iron rod is wasted and taking the number of 12cm long pieces as x and 20cm long pieces as y construct a pair of simultaneous equations. By solving the equations find separately the number of 12cm long pieces and 20cm long pieces of iron rods that are required.

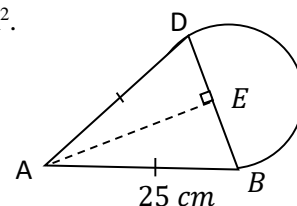
Find separately the maximum number of 12cm long and 20cm long pieces of wire that can be cut from an iron rod of 2m long so that no piece is wasted

5. The pie chart given below represents the information on class intervals of the marks obtained by a group of students in a Mathematics test.



The number of students who belong to the class interval 20 – 40 is twice the number of students who belong to the class interval 40 – 60.

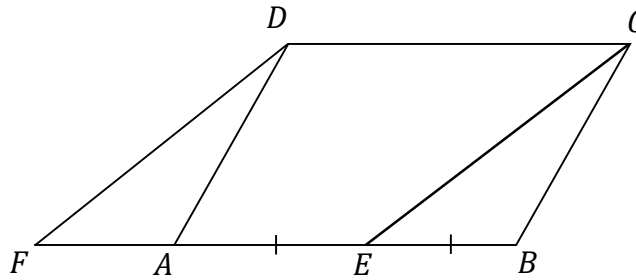
- Find the angle at the center of the sector which represents the number of students who belong to the class interval 60 – 100
 - If the number of students who belong to the class interval 40 – 60 is 4, find the total number of students that belong to this class interval.
 - The class interval 60 – 100 is separated into two class intervals 60 – 80 and 80 – 100. The angle at the center of the sector which represent the marks interval 80 – 100 is 45° . Find the number of students who obtained marks within the interval 60 – 80.
6. The perimeter of triangle ABD is 64cm and the area of it is 168cm^2 .
 $AB = AD = 25\text{cm}$ and BCD is a semicircle.
- Find the radius of the semi-circle
 - Find the total area of ABCD
 - Calculate the length of a side of a square in which the area is equal to the area of ABCD to two decimal places.



Part B

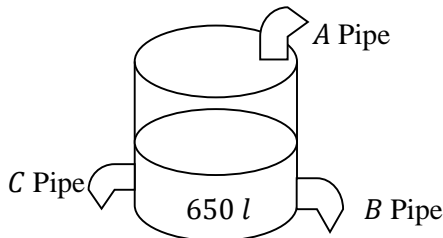
Answer only 05 questions.

7. ABCD given in the figure is a parallelogram. The midpoint of AB is E. BA is produced to F such that $AF = \frac{1}{2}AB$



- Copy the above diagram to your answer sheet and mark the given data
- Prove that $\triangle BEC \cong \triangle AFD$
- Prove that FECD is a parallelogram.
- If $\angle EBC = 110^\circ$ and $\angle FDA = 30^\circ$ find the value of $\angle DCE$

8.

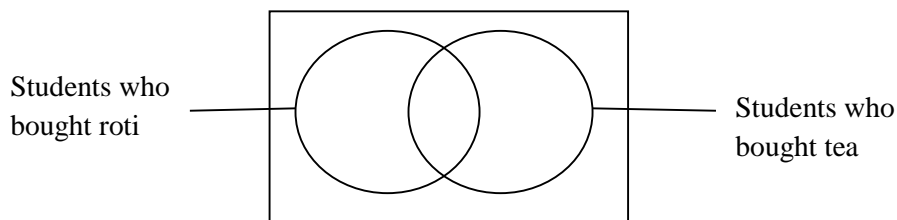


The rate at which water flows from pipe A is 100 l per minute.
The rate at which water flows from pipe B is 40 l per minute.
The rate at which water flows from pipe C is 50 l per minute.

The figure depicts how a tank of capacity 1000 l is processed to supply water to a cultivation plot. The tap of pipe C automatically closes for a minute after it has been opened and water flows through in this manner. When the tank is completely filled, all the taps close simultaneously. Calculate the volume of water drained from pipe B when all the taps are opened and closed again when the tank is 650 l filled initially.

9. Out of 600 students who visited the 'Rasa Roti' canteen of Gnanaloka University, 250 students bought roti and 280 students bought tea. 80 of them bought both roti and tea. Others did not buy any food items and spent the time talking to their friends.

Copy the Venn diagram given below in to your answer script, find the number of elements belonging to each region using the given information, and write them in the relevant regions

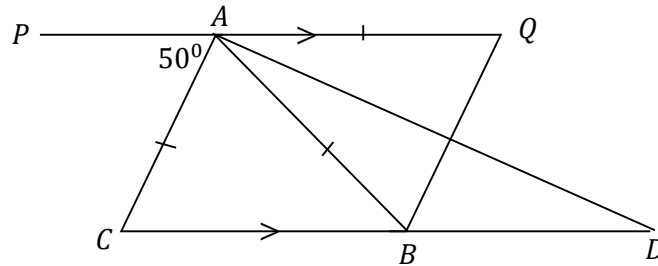


- Find the number of students who bought roti.
- Find the number of students who bought tea.
- How many students has bought only tea?
- Shade the region which represents the students who bought only one of the items roti or tea.
- Show the number of students who did not buy any of these food items as a percentage of the total number of students who came to the canteen.

10. (i) If $\log_x 2 = a$ and $\log_x 3 = b$ write down $\log_x 12$ in terms of a and b
 (ii) Without using the logarithmic table evaluate the following expression.
 $\log_{10} 30 + \log_{10} 20 - \log_{10} 16$
 (iii) Simplify using a logarithmic table.

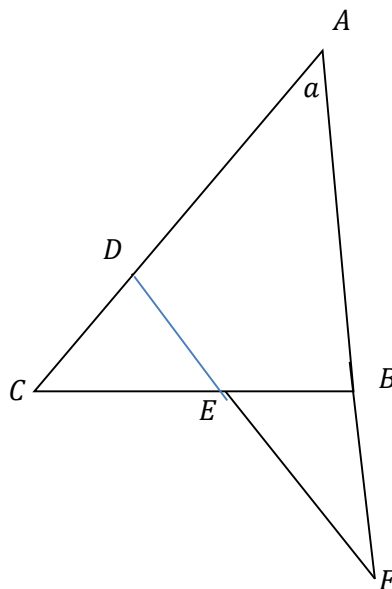
$$\frac{7.45 \times 12.83}{8.32}$$

11. In the following figure $PQ \parallel CB$ and $AC = AB = AQ$. $\angle PAQ = 50^\circ$ and the bisector of $\angle BAQ$ intersects CB at D . By giving reasons find the magnitude of the following angles



- (i) $\angle ABC$
 (ii) $\angle BDA$
 (iii) $\angle BAC$
 (iv) $\angle BQA$

12. In the triangle ABC , $AB = AC$. D and E are on AC and BC such that $CD = CE$. Extended DE and AB are intersected at F . If $DA = DF$ and $\angle BAC = a$, prove that $\angle ACB = 3a$



PARCEL NO



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ඕනෑම තොරතුරු ඉක්මනින්
නිවසටම ගෙන්වා ගන්න



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කෙටි සටහන්, වැඩ පොත්, අතිරේක කියවීම් පොත්, සඟරා
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