ST. JOSEPH'S COLLEGE – COLOMBO 10

First Term Evaluation – 2023 (July)

English Medium

GRADE - 10

MATHEMATICS - I

Time : 2Hours

Name :…….

Class :……..

Class Number: ……..

Important:

- This paper consists of 8 pages.
- Write your name and your class number on this page.
- Answer all the questions on this paper itself.
- Use the space provided under each question for working and writing the answer.
- It is necessary to indicate the relevant steps and the correct units in answering the questions.
- Marks will be awarded as follows.
  In part A,
  2 marks for each question.
  In part B,
  10 marks for each question.

For the use of the examiner

Question Number	Marks
1-25	
1	
2	
3	
4	
5	
Total	

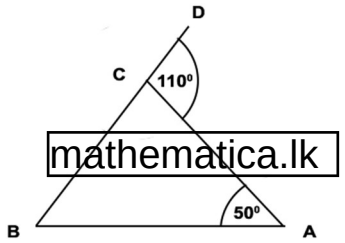
Part A

Answer all the questions on this paper itself.

(1) Find the selling price of an item that was bought for $Rs.5000$ and sold keeping a profit of 10%

(2) Simplify $\frac{x}{3}+\frac{x}{2}$

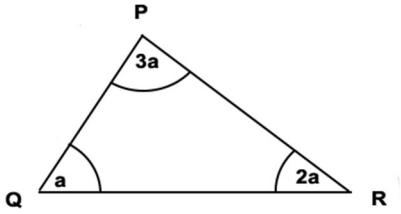
(3) Using the information on the diagram find the magnitude of $A\hat{B}C$.



(4) Factorize $9x^2-25$

(5) Between which integers is $\sqrt{12}$?

(6) Based on the information given, find the magnitude of $P\hat{Q}R$.

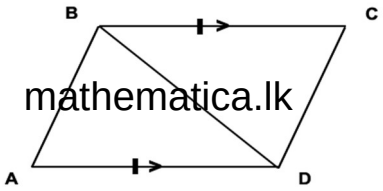


(7) Fill in the blanks.

$(3x-\ldots\ldots\ldots)^2 = \ 9x^2-\ldots\ldots\ldots\ldots+25$

(8) Find the area of a sector of a circle that was cut from a circle of radius $7cm$ if the angle at the center of the cut sector is 90^0.

(9) Write the case under which the triangles ABD and BCD on the given diagram are congruent.

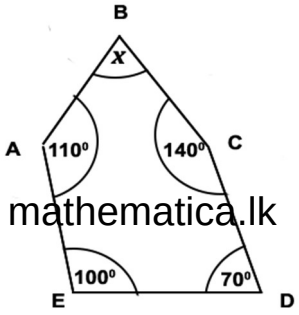


(10) On the set of numbers $4, 5, 3, 2, 1, 4, 8$,

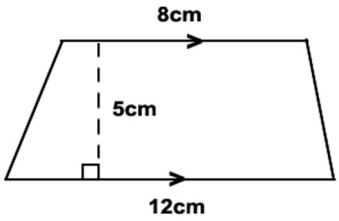
(i) Find the mode.

(ii) Find the median.

(11) Using the information given, find the magnitude of $A\hat{B}C$.



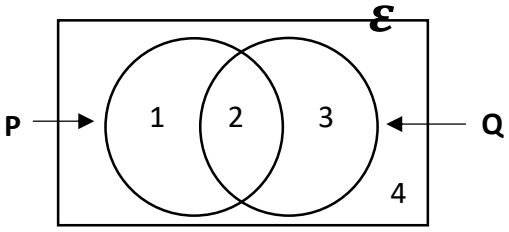
(12) Find the area of the given figure.



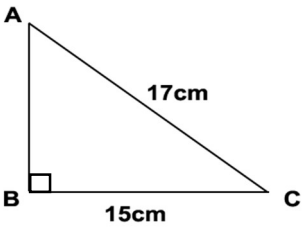
(13) According to the Venn diagram,

(i) Write the set $P \cap Q$

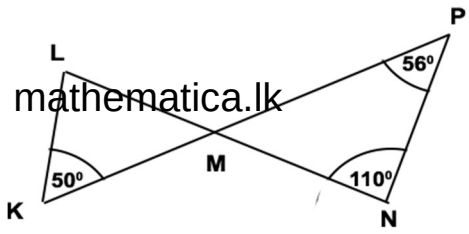
(ii) Find $n(P')$



(14) Find the length of AB.

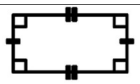


(15) Find the magnitude of $K\hat{L}M$



(16) Solve $\frac{x}{2} - 1 = 5$

(17) Mark the correct statements with ✓ and the incorrect statements with ✗

 Is a regular polygon	
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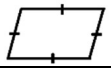
 Is a regular polygon	

(18) If $a - b = 7$ and $ab = 5$, find the value of $a^2 + b^2$

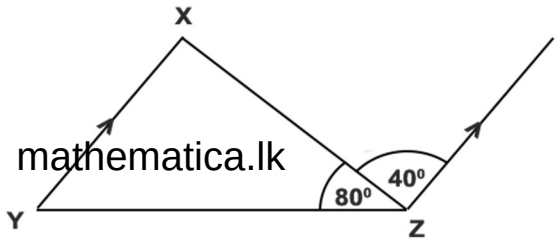
(19) Factorize $x^2 - x - 30$

(20) A broker charges a commission of 5% from the selling price for facilitating its sale. Find the selling price of the car if the commission charged was $Rs. 30\ 000$

(21) Find the volume of a tank with a uniform cross-sectional area of $400cm^2$ and a height of $5cm$.

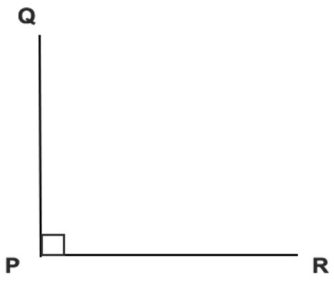
(22) Find the gradient and the intercept of the graph of the function $2y - x = 7$

(23) Find the magnitude of $x\hat{y}z$



(24) A bag contains blue and green colored beads that are identical to each other except in color. The probability of getting a blue colored bead when one is taken at random is $\frac{3}{5}$. Find the total number of beads in the bag if there are 10 green colored beads.

(25) PQ and PR are perpendicular borders of a certain piece of property. A tree is planned to be planted at the point O which is $3m$ away from PQ and $5m$ away from P. Using your knowledge on loci, sketch how you would find the location of O.



Part B

Answer all the questions on this paper itself.

(1)

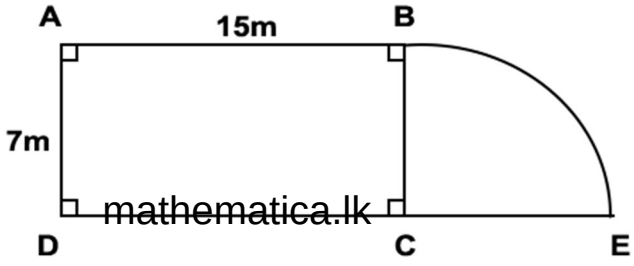
(a) A person spends $\frac{1}{5}$ of the money he has on food and $\frac{1}{6}$ of the remaining amount on travelling.

(i) What fraction of the total amount of money was spent on both food and travelling?

(ii) If he spends $\frac{1}{2}$ of the remaining amount after those expenses to buy a few clothes, find the amount that was spent on clothing as a fraction of the total amount.

(iii) After all those expenses if the amount remaining with him was Rs. 5000, find the amount of money he had at the beginning.

(2) The sketch given represents a swimming pool $ABCD$. The sector of the circle BCE represents a garden attached to the pool.



(i) Find the length of the arc BE.

(ii) Find the perimeter around the whole region.

(iii) Find the area of the whole region.

(iv) A triangular shaped flower bed having an area equal to that of the sector BCE is suggested to be attached to BC , such that extended CE becomes a side. Indicate on the given diagram a sketch of the proposed flower bed clearly indicating the dimensions.

(3) A salesman marks the price of an item that he purchased for $Rs.8000$ keeping a profit of 12%. He decides to offer a discount of 5% to a customer at the time of purchase.

(i) Find the price marked on the item.

(ii) Find the final selling price of the item.

(iii) Find the profit the seller makes.

(iv) Express his profit as a percentage.

(4)

(a) A pen was taken out at random from a box which contains 5 red pens and 3 blue pens that are identical to each other except in color.

(i) Write the sample space for the above random experiment.

(ii) Find the probability of the selected pen being red.

(iii) Find the probability of the selected pen being blue.

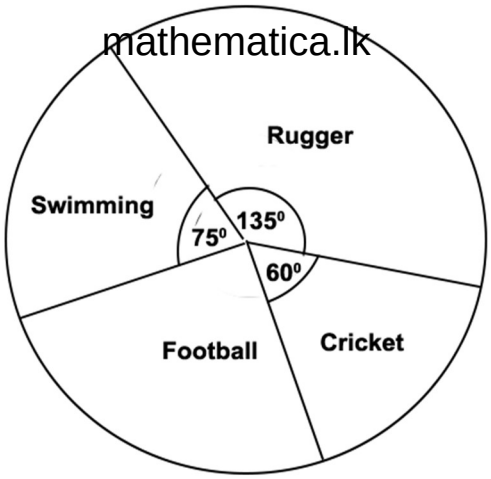
(b) Answer the following questions based on the information on the table which depicts the information on some cookies in a bag which are identical except in color and flavor. A cookie is randomly taken out.

Color / Flavor	Blue colored	Red colored
Vanilla flavored	40	25
Chocolate flavored	15	10

(i) Find the probability of getting a red colored vanilla flavored cookie.

(ii) Find the probability of getting a chocolate flavored cookie.

(5) The given pie chart represents the sport preferred by 240 students.



(i) What fraction of the total number of students prefer football?

(ii) How many students prefer rugger?

(iii) How many students prefer swimming?

(iv) If after two months 10 students who preferred cricked changed their preference to football, find the new angle at the center that represents the students who prefer cricket.

ST. JOSEPH'S COLLEGE – COLOMBO 10

First Term Evaluation – 2023 (July)

English Medium

GRADE - 10

MATHEMATICS - II

Time : 3 Hours

Instructions :-

- *Answer ten questions selecting five questions from part A and five from part B.*
- *Write the relevant steps and the units when answering the questions.*
- *Each question carries ten marks.*

Part A

Answer five questions only.

(1) If a commission of Rs. 240 000 was paid in selling a car worth Rs. 8 000 000,

(a)

(i) Find the amount the owner of the car gets.

(ii) What percentage has been charged as the commission?

(b)

(i) Find the marked price of a refrigerator which was sold for a price of Rs. 31 500 if a discount of 10% had been offered.

(ii) Find the discount offered.

(2) Given below is an incomplete table constructed to draw the graph of the function $y = 3x - 2$

x	-3	-2	-1	0	1	2
y	-11	… … ….	-5	… … …	1	4

(i) Find the value of the function when $x = -2$ and $x = 0$

(ii) Draw the graph of the above function using a suitable scale.

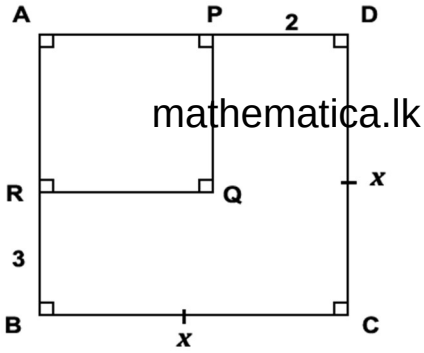
(iii) Write the intercept and the gradient of the graph.

(iv) Find the value of x when $y = 7$

(v) Write the equation for the function of the graph that is parallel to the above graph but goes through the origin.

(3)

(a)



(i) If $AP = x - 2$ express the length of AR in terms of x

(ii) Write an expression for the area of the rectangle $APQR$

(iii) Find the area of $APQR$ if $x = 5cm$

(b) Evaluate using your knowledge on factors.

(i) $35^2 - 15^2$

(ii) $53^2 - 7 \times 53 + 12$

(4) In a school the laboratory is located $70m$ away from the main hall at a bearing of 050^0. The library is located $60m$ away from the main hall at a bearing of 130^0 .

(i) Draw a scale diagram to represent the above information by representing $10m$ from $1cm$

(ii) Find the real distance between the library and the laboratory.

(iii) What is the bearing of the main hall from the laboratory.

(5)

(a) The price of 3 apples and 2 oranges is $Rs.230$. The price of an apple and 2 oranges is $Rs.130$. Build a pair of simultaneous equations by taking the price of an apple to be $Rs.x$ and the price of an orange to be $Rs.y$. Simplify the two equations and find separately the price of an apple and an orange.

(b) Simplify.

$$\frac{2x+5}{7} - \frac{(x+1)}{7}$$

(6) The monthly consumption of water in a neighborhood with 50 households is given in the following table.

Number of units of water consumed in a month	5	10	15	20	25	30	35
Number of households	5	4	7	10	11	8	5

(i) Find the mode.

(ii) Find the median

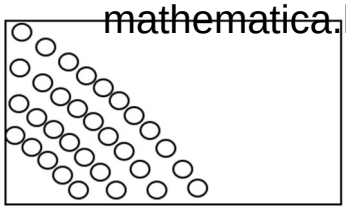
(iii) What is the mean number of units consumed by a household.

(iv) Using the answer in (iii) above show that the consumption of water in 300 households in a similar neighborhood does not exceed 13 000 units.

Part B

Answer five questions only.

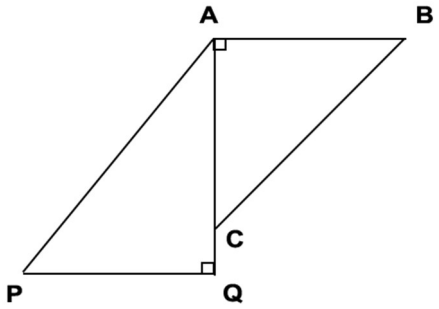
(7) The diagram given below shows the arrangement of electric bulbs on a 'Vesak Pandol'. The first row contains 5 bulbs, the second row 7 bulbs and any other given row contains 2 more bulbs than the previous row.



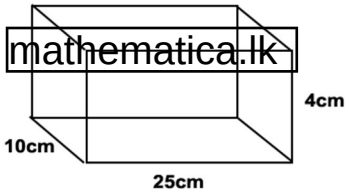
(i) Write separately the number of bulbs required for the first three rows in order.
(ii) Find the number of bulbs on the tenth row.
(iii) Which row should contain 33 bulbs?
(iv) Show that the number of bulbs on the $(n+1)^{th}$ row is $2n+5$

(8) Use only a straight edge with a cm/mm scale and a protractor for the following constructions. Indicate the construction lines clearly.
(i) Construct the triangle PQR where $PQ = 8cm$, $P\hat{Q}R = 75^0$ and $QR = 6cm$
(ii) Construct the locus of points that are equidistant from P and Q
(iii) Construct the locus of points that are equidistant from PQ and PR
(iv) Name the point of intersection of the two loci constructed on (ii) and (iii) above as O and draw the circle with center O and radius OP. Measure and write the radius of the circle.

(9) On the given diagram $B\hat{A}C = P\hat{Q}A = 90^0$, $AB = PQ$ and $AP = BC$.
(i) Show that $\Delta APQ \equiv \Delta ABC$
(ii) Show that $AQ = AC$
(iii) Prove that $AP//BC$



(10)
(a)
(i) Find the volume of the given cuboidal tank.
(ii) Find its capacity in liters.
(iii) If 8 cube shaped tanks were made such that the combined volume of the 8 cubes is equal to the volume of the above cuboidal tank, find the side length of a cube shaped tank.



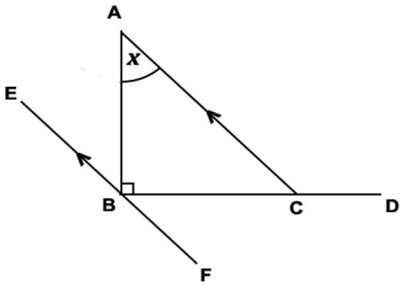
(b) If the daily consumption of water by an individual person is $450l$, find the weekly consumption of water by a family of four.

(11)

(a) In the given figure $B\hat{A}C = x$ and $A\hat{B}C = 90^0$. EF is a straight-line segment parallel to AC that goes through B.

(i) Find the value of $A\hat{C}D$ in terms of x

(ii) Show that $A\hat{C}D = E\hat{B}C$.



(b) The interior angles of a triangle are in the ratio $5:3:1$. Find separately the magnitudes of the three interior angles of the triangle and name the category of triangles to which it belongs based on the interior angles.

(12) $\varepsilon = \{Integers\ between\ 1\ and\ 10\}$ mathematica.lk

$A = \{Prime\ numbers\ smaller\ than\ 8\}$

$B = \{Digits\ in\ the\ number\ "2423"\}$

(i) Draw a Venn diagram to represent the above information.

(ii) Write in terms of elements $A \cap B$

(iii) Write in terms of elements A'

(iv) Write in terms of elements $A \cup B$

(v) Find $P(A \cap B)$ if a number from the universal set is selected at random.

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