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Department of Education, Southern Province

YEAR END EVALUATION 2022 / 2023

Grade 10	MATHEMATICS I	2 hours

Name / Index Number .....

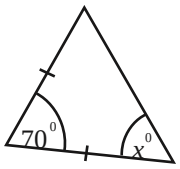
PART A

- **Answer all the questions in the paper itself.**

1. The telephone charge for a certain month is Rs. 4000. If a value added tax (VAT) of 18 % is added for it, how much is the VAT to be paid?

2. Write $log_3 81 = 4$ in index form.

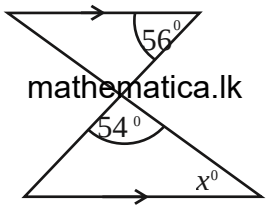
3. Find the magnitude of x^0 by using the information in the figure.



4. Factorize. $4 - x^2$

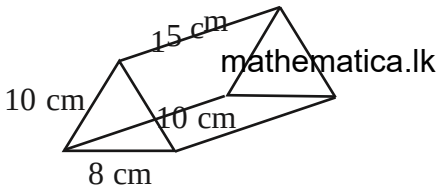
5. The perimeter of the following sector of the circle is 50 cm cut out from the circle of circumference 88 cm. Find the radius.

6. Find the magnitude of x^0 by using the information in the figure.



7. Find the Least Common Multiple of $4a^2b$,$12ab^2$

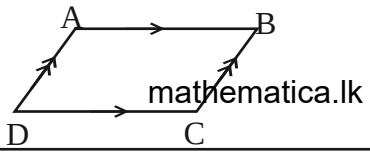
8. Draw and write the measurements of two different rectangular faces of the triangular prism.



9. If $5.1 \times 5.1 = 26.01$

   $5.3 \times 5.3 = 28.09$

   $5.4 \times 5.4 = 29.16$ find the first approximation of $\sqrt{29}$

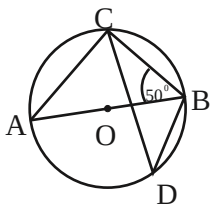
10. 

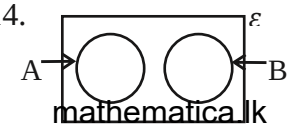
The area of the parallelogram with AB = 9cm and BC =12 cm is 72 cm^2. What is the perpendicular distance between AB and CD?

11. The imported price of a mobile phone is Rs. 60 000. It costs Rs. 75 000 after paying customs duty. Find the percentage charged as custom duty?

12. Find the minimum area of the paper required to paste a label to cover the curved surface of a cylindrical salmon tin with radius 7 cm and height 10 cm.

13. Find the magnitude of $B\hat{D}C$ in the circle of diameter AOB.



14. 

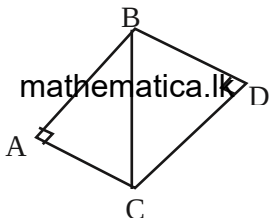
A and B are disjoint sets n (ε) 50, n(A) = 12, n(A∪ B)′ =10, Find n (B)

15. The probability of a randomly selected student being a boy from a class of 30 students is $\frac{3}{5}$. How many girls are there in the class?

16. In this pair of right angled triangles $\hat{A} = \hat{D} = 90^0$. And $A\hat{B}C = B\hat{C}D$

   i. Are these triangles congruent?

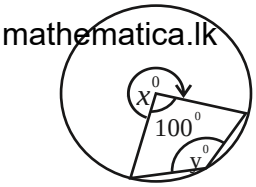
   ii. If so, write the case of congruency.



17. Simplify. $\frac{5}{2a} - \frac{7}{8a}$

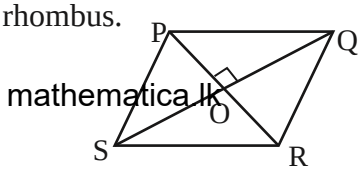
18. Find the equation of the straight line which passes through the point (0, 4) and parallel to the line $y=3x-2$

19. Find x and y.



20. $7a + 2b = 24$
$2a - 3b = 4$ Find ($a + b$) without solving the simultaneous equations.

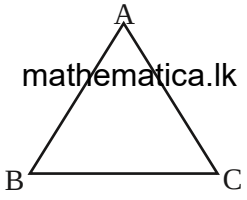
21. If PR = 6cm,QO = 4cm in the rhombus PQRS, find the perimeter of the rhombus.



22. The roots of a quadratic equation in x are 3 and -2.
Write that quadratic equation of the form $(x + a)(x + b) = 0$

23. A right circular cylinder is filled half its height with water. That amount of water is 125 ml. If 25 small identical balls are dropped in to the cylinder, 25 ml of water is over flown. Find the volume of a ball.

24. The locus of the points equidistant from AB and AC passes through point P which is on the line BC. Draw a rough sketch to mark the point P.



25. A certain task can be completed in 15 days by 4 men. How many men are required to complete this task in 12 days?

PART B

1. $\frac{1}{8}$ of a certain journey is travelled on foot, $\frac{1}{4}$ by three wheeler and $\frac{2}{5}$ of the remaining journey by bus. There is another 6 km to travel.

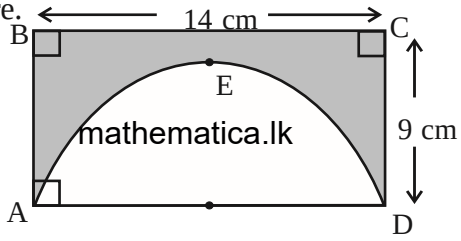
   i. What fraction of the total journey is travelled on foot and by three wheeler?

   ii. What fraction of the total journey is traveled by bus?

   iii. Find the remaining part to travel further as fraction of the total journey?

   iv. Find the total distance of the journey.

2. ABCD is a rectangle and AED is a semi-circle in the figure.

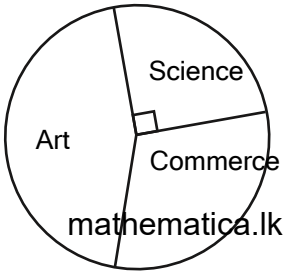
   i. Find the arc length AED.

   ii. Find the perimeter of the shaded part.

   iii. Find the area of the shaded part.

   iv. If a rectangular part is joined externally to the figure that is equal to the area of the shaded part such that AD is a boundary. Draw the rough sketch and mark the breadth.

3. There are 1080 students of a school studying Arts, Commerce and Science stream. Among them $\frac{1}{4}$ are studying in Science stream. There are 450 students studying in Arts stream. Given below is the pie chart showing the above information.

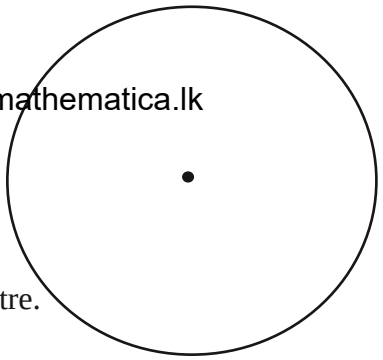


i. Complete the table using the information given.

Stream	Number of students	Angle at the centre
Science		90^0
Arts	450	
Commerce		

ii. The Science stream is divided into two sections as Physical science and Biological science. The ratio of the number of students studying Physical science to that of Biological science is 2:3. Find the number of Physical science students.

iii. 30 students who had difficulty in studying the Science stream were referred to the arts stream with the approval of the Principal. Accordingly, draw the above pie chart again with the angles at the centre.



4. The table below shows how an individual's income tax is charged in previous years.

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

i. Amal's monthly income is Rs.100 000. Find his annual income.

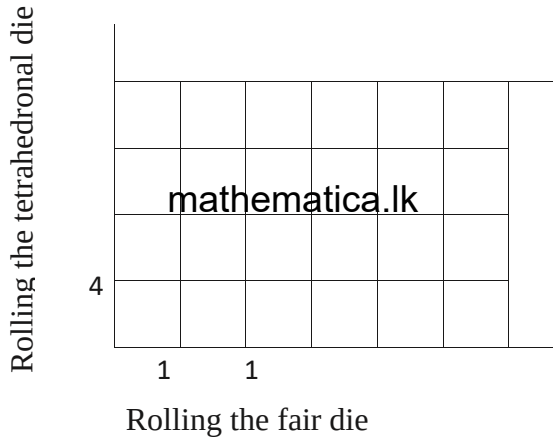
ii. Calculate the annual income tax Amal has to pay.

iii. If Bimal paid an annual income tax of Rs. 52 000. What is his annual income?

iv. According to the new taxation, if those who earn an income of Rs. 100 000 a month have to pay 6% income tax monthly, how much annual tax amount will Amal have to pay?

---

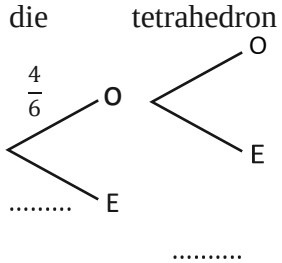
5. (a) A fair die numbered 1, 2 and 3 on the opposite sides and a fair regular tetrahedronal die numbered as 4, 5, 6 and 7 are rolled at the same time and play. Complete the following grid to represent the two possible values.



i. Encircle and find the probability of the event that the sum of the two numbers being 9 or greater than 9.

ii. Find the probability of the two numbers being an even number.

(b) The diagram below is drawn to represent whether the values obtained from both the above die are odd or even.



i. Complete and mark the probabilities on the branches of the given tree diagram.

ii. Find the probability of getting an odd number from one die and an even number from the other die

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Department of Education, Southern Province

THIRD TERM TEST 2022 / 2023

Grade 10 | **MATHEMATICS II** | **3 hours**

Name / Index Number ..... additional 10 minutes to read

Important:

- **Answer ten questions selecting five questions from Part A and five questions from Part B.**
- **Write relevant steps and correct units in answering the questions.**
- **Each question carries 10 marks.**

PART A

❖ **Answer five questions only.**

---

1. An incomplete table to draw the graph of $y = 5 - x^2$ is given below

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

(a) i) Find the value of y when x = 2
ii) Draw the graph of the above function on a standard system of axes using a suitable scale.

(b) i) Find the maximum value of the function.
ii) Declare the coordinates of the turning point of the function $y = x^2 - 5$

(c) i) Write the interval of values of x which $y > 2$
ii) Find the value of $\sqrt{5}$ using the graph.

---

2. i) Mr.Siripala lends an amount of Rs. 80 000 for two years at 15% annual interest and at the end of the 2 years he gets back interest and the loan amount. Find the annual rate of interest he has to charge to get a sum of Rs. 124 800 after one year by he lends the entire amount he has.

ii) He spent part of his money to buy a property. For that he has pay an annual rate of Rs. 7 200 to a provincial council which charges 8% of annual percentage rate, find the amount he spent to buy the property.

---

3. (a) The price of a book is Rs.7 more than the price of 3 pencils. The cost of 5 books and 2 pencils is Rs. 341. By taking the price of a book as x and the price of a pencil as y and construct a pair of simultaneous equations. Solve it and find the price of a book and the price of a pencil.

   (b) Solve the equation $\frac{3}{(a+2)} - \frac{1}{(a+2)} = \frac{2}{15}$

---

4. The grouped frequency distribution obtained by analysing the scores of 40 students who scored 20 to 54 for Mathematics is given below.

Class intervals of marks	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54
Number of students	1	5	6	13	8	4	3

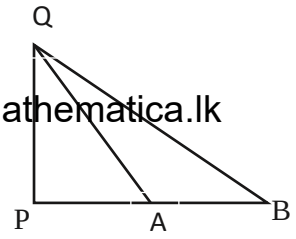
   i. What is the modal class?

   ii. Using the mid value of the modal class as the assumed mean, find the mean mark of a student to the nearest whole number.

   iii. According to this distribution, show that the sum of the maximum marks obtained by students who scored more than 39 marks is less than 711

---

5. The figure shows a vertical pole PQ fixed on a ground and points P, A, B on a same line of the horizontal ground.
   Height of the PQ pole is 20 m. The distance AB is 16 m.
   The angle of depression of A from Q 60°



   i. Draw a rough diagram and include the information.

   ii. Draw a scale diagram using the scale 1 cm represents 4m

   iii. Find the actual distance AP. Measure and write the angle of elevation of Q from B

---

6. (i) The breadth of a rectangle is x. The length of the rectangle is 6cm less than twice of its breadth. Area of the rectangle is 140 cm^2. Find the length in terms x and show that x satisfies the quadratic equation $x^2 - 3x - 70 = 0$

   (ii) Show that x has only one suitable value.

   (iii) Find the perimeter of the rectangle

PART B

❖ **Answer five questions only.**

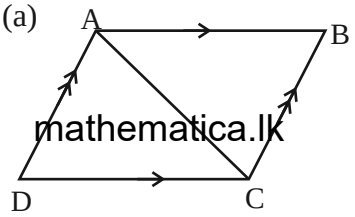
---

7. Consider the pattern of multiples of 3 in between 200 and 400.
   i. Write the first term and the last term.
   ii. Write the number of multiples of 3 in between 200 and 400.
   iii. Find the 10^{th} term of the pattern.
   iv. Find the sum of first ten terms.

---

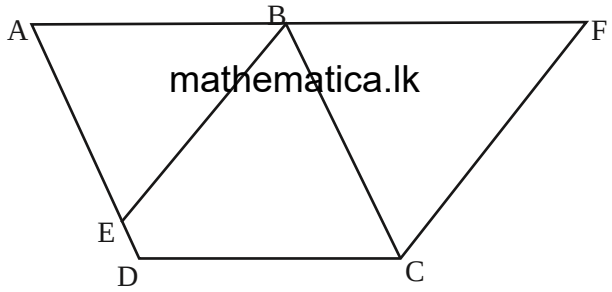
8. (i) Construct the triangle ABC such that AB = 6.5 cm, $B\hat{A}C = 30^0$, $A\hat{B}C = 60^0$
   (ii) Construct the locus of the points equi distant from points A and C and name the point of intersection and AB as D
   (iii) Construct a perpendicular to AB at D
   (iv) Draw a circle with centre D and radius CD
   (v) Why AB is a diameter of the circle ? Give reasons

---

9. (a) 

Prove that the opposite sides of a parallelogram are equal by using congruency of triangles.

(b) ABCD is a parallelogram . The angle bisector of $A\hat{B}C$ is BE. BE and FC are parallel.



i.Copy the diagram and include the information.

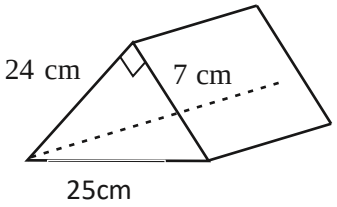
ii. Show that $B\hat{C}F = B\hat{F}C$

iii. Show that AF= BC + CD

---

10. (a) Given right triangular prism with right triangular cross section is made by melting a solid metal cylinder of radius 7 cm and height 30cm without any wastage.

Find the length of the prism.



(b) If A = $\frac{5.83 \times 783.6}{96.5}$ Find the value of A to the nearest first decimal place using logarithmic tables.

---

11. COD is a diameter of a circle of centre O. OA $/\!/$ BC and A$\hat{D}$C = x

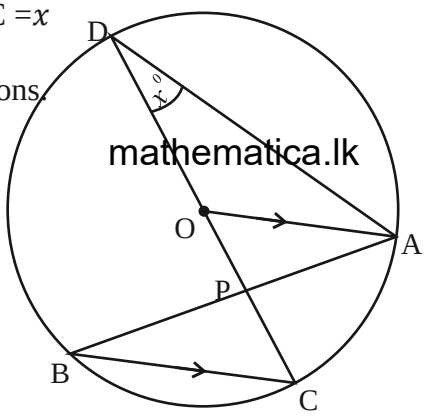
a) Find the following angles in terms of x by giving reasons.

i. A$\hat{C}$D

ii. A$\hat{B}$C

iii. A$\hat{O}$C

b) Prove that A$\hat{P}$C = 3 OAB



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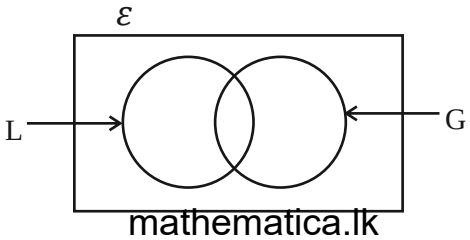
10. In a mixed school 29 out 50 children are boys. Twenty two boys are right handed. Twelve children are left handed.



L = { left handed children}

G = { girls }

i. Include this information in a Venn diagram.

ii. How many girls are left handed?

iii. How many children are right handed?

iv. Shade the region L $'$ ∩ G and explain it in words.

v. If all the boys are right handed , represent the above information on another Venn diagram.

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