

දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
 தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம்
 Department of Education, Southern Province Department of Education, Southern Province Department of Education, Southern Province Department of Education, Southern Province
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 Department of Education, Southern Province Department of Education, Southern Province Department of Education, Southern Province Department of Education, Southern Province

අවසාන වාර පරීක්ෂණය - 2023 (2024)
 ஆண்டிறுதிப் பரீட்சை - 2023 (2024)/ Final Term Test - 2023 (2024)

ශ්‍රේණිය }
 தரம் } Grade 11
 Grade

MATHEMATICS - I

කාලය }
 நேரம் } Two hours
 Time

නම }
 பெயர் }
 Name

විභාග අංකය }
 சுட்டிலக்கம் }
 Index No.

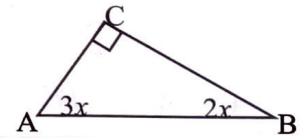
- Answer all questions on this paper itself.
- 2 marks for each correct answer for the questions in part A and 10 marks for each questions in part B.

Part A

01) The assessed annual value of a certain shop is Rs. 90 000. If the relevant provincial council charges a rate of 12%, find the annual rates of the shop.

02) Express $x = 10^{0.4969}$ in logarithm form.

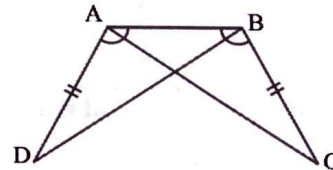
03) Find the value of $\angle ABC$ in the given figure.



04) Underline the correct pair of factors of $2x^2 - x - 6$

- i) $(2x - 3)(x + 2)$ ii) $(2x + 1)(x - 6)$ iii) $(2x + 3)(x - 2)$ iv) $(2x - 1)(x + 6)$

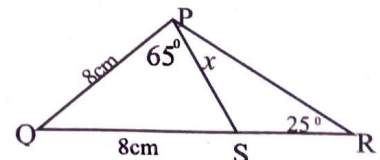
05) If $AD = BC$ and $\angle DAB = \angle ABC$ in the figure,
 i. Name the pair of congruent triangles.



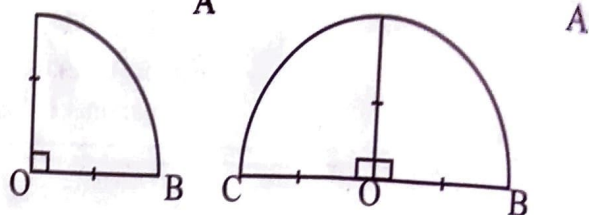
ii. Name the case of congruency.

06) Find the LCM of the following algebraic terms. $3a^2$, $9ab$, ab^3

07) Find the value of x , by using the information given in the figure.

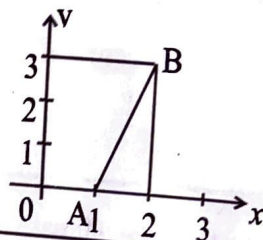


- 08) Perimeter and arc length of the sector AOB are 50 cm and 22 cm respectively. Find the perimeter of the semi-circle consisting of 2 such sectors.



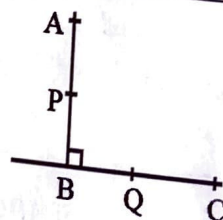
- 09) It has been estimated that 4 employees need 8 hours per day to complete a certain task. What is the magnitude of the task in man hours, if it is completed within 3 days?

- 10) Find the gradient of the straight line AB.

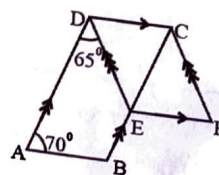


- 11) If $A = \{1, 2, 3, 4, 5, 6\}$, $A \cap B = \{1, 3, 6\}$ and $A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8\}$, write the set B.

- 12) AB is a vertical tower on a horizontal ground. If the angle of elevation of P from Q is 35° and the angle of depression of C from A is 40° , represent the information given on the above diagram. (Neglect the height of the observer)



- 13) Find the value of $\hat{EFC}$ using the information given in the figure.

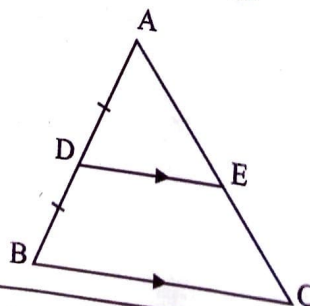


- 14) The first term and the sum of the first two terms of a geometric progression is 3 and 15 respectively. Find the 3rd term of it.

- 15) Solve the inequality $x + 3 \leq 5$ and write the set of positive integral solutions.

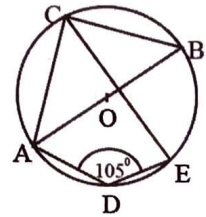
- 16) According to the information given in the figure, put a "✓" mark in front of each correct statement in the table.

$AE = EC$	
$BC = \frac{1}{2}DE$	
$BC = 2DE$	



- 17) If $x + 3y = 13$
 $x - y = 5$ Find the value of $x + y$, without solving equations.

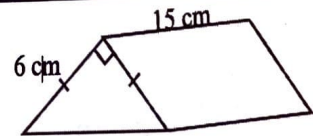
- 18) The center of the circle in the figure is O. If $\widehat{ADE} = 105^\circ$,
 find the value of $\widehat{BCE}$



- 19) If the first quartile of a number pattern written in ascending order is equal to the 5th term of it, find the number of terms in that number pattern.

- 20) If the solutions of the quadratic equation $(x - 2)(x + 3) = 0$ are x_1 and x_2 , find the value of $x_1 + x_2$

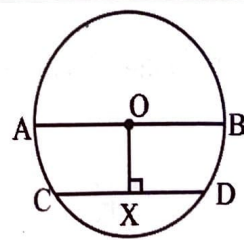
- 21) Find the volume of the prism according to the given information.



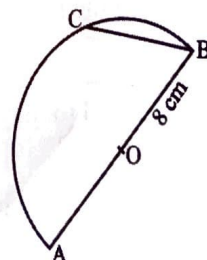
- 22) There are 36 white and black identical beads in a container. The probability of a bead drawn randomly from the container being white is $\frac{5}{12}$. Find the number of black beads in the container.

- 23) If $\sin \theta = \frac{5}{13}$ and $\cos \theta = \frac{12}{13}$, find the value of $\tan \theta$

- 24) The diameter of a circle with centre O is 20 cm and $CD = 12$ cm.
 Find the length of OX using the information given below.



- 25) O is the center of the semicircle with radius 8 cm in the given figure. C is a point on the circle. By using the knowledge of loci complete the sketch to find the location of D which is equidistant from BA & BC and also 8 cm away from O.



Part B

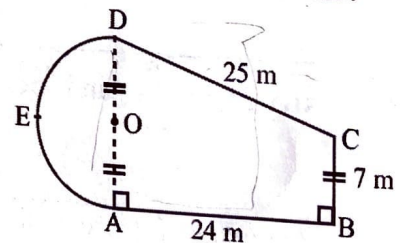
Answer all the questions on the question paper.

01) A fruit seller bought a stock of mangoes. $\frac{1}{9}$ of the stock was spoilt. $\frac{1}{4}$ of the unspoilt mangoes was ripped and the rest was separated as raw mangoes.

- What fraction of the total stock of mangoes was unspoilt?
- What fraction of the total stock of mangoes was ripped?
- If $\frac{1}{8}$ of raw mangoes was ripped on the next day, what fraction of the total stock of mangoes was ripped now?
- Now the number of raw mangoes was 100 more than the number of ripped mangoes. Find the total number of mangoes.

02) The figure shows a children's park consisting of a quadrilateral ABCD and a semi circle AED.

- Find the arc length AED.



- Find the total distance who walked around the children's park three times.
- What is the area of the children's park?
- It is needed to change the quadrilateral ABCD as a rectangle AGFD without changing the area. Draw the new rectangle with its measurements on the above diagram itself.

03) Lakmal had to pay Rs. 90 000 as customs duty when a motor cycle worth Rs. 200 000 is imported.

- What was the percentage tax that was charged?

He decided to sell the motor cycle imported for Rs. 350 000. If a VAT of 18% is added to the selling price when it is sold,

- ii) Find the total amount to be paid by a customer to buy the motor cycle.

From the amount he obtained by selling the motor cycle, he deposited Rs. 350 000 in a financial institute at 15% annual compound interest.

- iii) Find the interest he received for the first year.

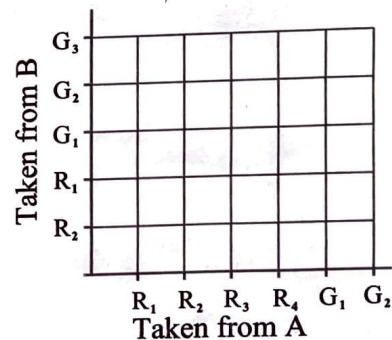
For the second year the compound interest was changed by the financial institute. When he closing the account after two years, if he got Rs. 450 800 as the total amount,

- iv) Find the annual interest rate paid for the second year.

- 04) The box A contains 4 red apples and 2 green apples and the box B contains 2 red apples and 3 green apples. All the apples are identical in shape and size.

If Nipun takes out an apple randomly from box A and then from box B,

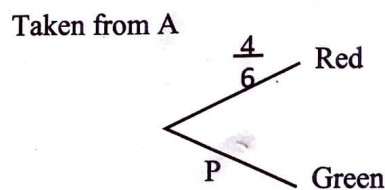
- i) By taking red apples as R and green apples as G, represent the sample space in the given grid.
- ii) Encircle the event A of both apples taken out being the same in colour. Find $P(A)$.



- (b) Nipun takes out an apple randomly from the box A. If it is a red apple he gives it to his sister and if it is a green apple he puts it into the container again. Then he again takes out an apple randomly from the box B.

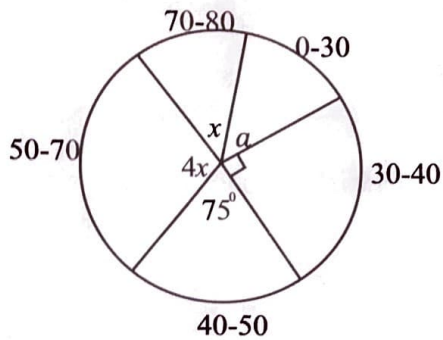
The incomplete tree diagram shows the colour of the apple taken out from the box A.

- i) Find the value of P.



- ii) Extend the tree diagram considering the apple taken out from the box B being red or green.
 iii) Find the probability of getting a red apple at least once.

05) The following is a pie chart and an incomplete table representing the range of marks obtained by 48 students for a mathematics question paper for which 80 marks are given.



Marks	0 - 30	30 - 40	40 - 50	50 - 70	70 - 80
Number of students	6				4

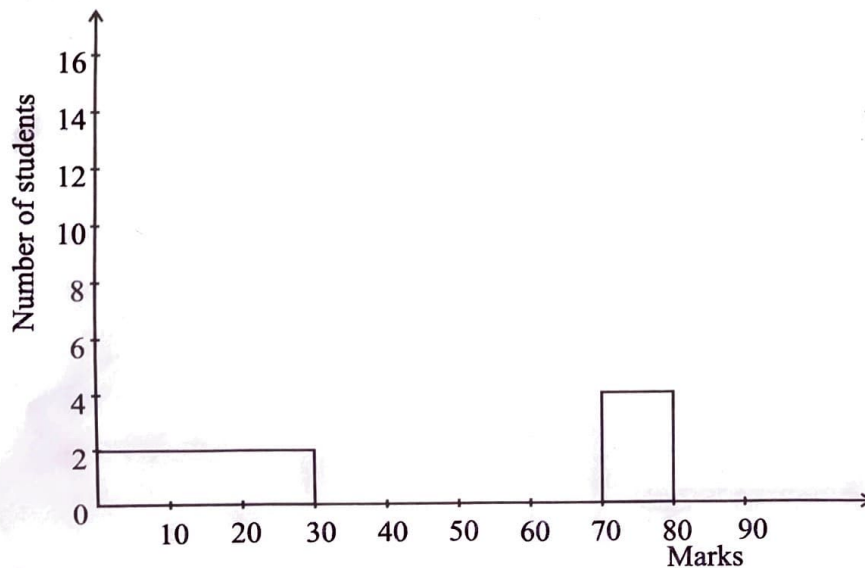
(30 - 40 means greater than or equal 30 and less than 40)

i) Complete the table according to the pie chart.

ii) Find the values of a and x angles at the centre.

iii) Using the table completed above, draw the histogram on the following axes.

iv) Draw the relevant frequency polygon on the histogram you drawn.



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ශ්‍රේණිය }
தரம் } Grade 11

MATHEMATICS - II

කාලය }
நேரம் } Three hours

නම
பெயர்
Name

විභාග අංකය
சட்டிலக்கம்
Index No.

Extra 10 minutes for reading

Important:

- ❖ Answer 10 questions by selecting 5 questions from part A and 5 questions from part B.
- ❖ Each questions carries 10 marks.
- ❖ The volume of a right circular solid cylinder of radius r and height h is $\pi r^2 h$

Part A

Answer 5 questions only.

- A set of furniture priced at Rs.180 000 for outright purchase can be bought by making a down payment of $\frac{1}{5}$ of its marked price and paying the rest in 24 equal monthly installments of Rs. 7 875. If the interest on the loan is calculated on the reducing loan balance, find the annual interest rate.
- y is a quadratic function of x . An incomplete table containing the values of y corresponding to several values of x is given below.

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

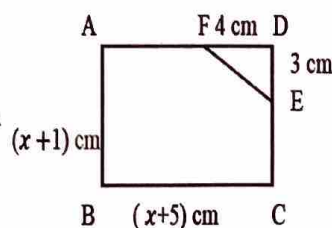
(a) i) By considering the symmetry of the function, find the value of y when $x = 4$

ii) Using the standard system of axes and a suitable scale draw the graph of the above function.

(b) Using your graph,

- Find the interval of values of x for which $y \leq 0$
- Express the above function in the form $y = (x - a)^2 + b$
- Find the roots of $x^2 - 4x - 1 = 0$

3. ABCD is a rectangular lamina of length $(x + 5)\text{cm}$ and breadth $(x + 1)\text{cm}$. When the right angled triangular part DEF is cut off from it, the area of the remaining part ABCEF is 35 cm^2 .



Show that x satisfies the quadratic equation

$x^2 + 6x - 36 = 0$. By solving it using completing squares or any other method.

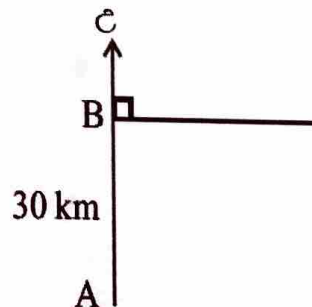
Show that the length CE exceeds 1.5 cm. ($\sqrt{5} = 2.23$)

4. Rupika brought 50 apples and 50 guavas to distribute among a group of people in a camp displaced by floods. It was just sufficient to give 2 pieces of apple to a child and a piece of apple to an adult by cutting each apple into 3 equal pieces and also it was just sufficient to give a piece of guava to a child and 3 pieces of guava to an adult by cutting each guava into 5 equal pieces.

- By taking the number of children as x and number of adults as y , build up a pair of simultaneous equations.
- By solving the equations, find the number of children and the number of adults in the camp.

(b) Simplify. $\frac{2x}{x^2 - 4} - \frac{1}{x - 2}$

5. The light house B is situated 30km North of harbour A. A boat which travels from harbour A on a bearing of 060° reaches harbour C located at East to the light house B within 40 minutes.



- Copy the given diagram onto your answer script and represent the given information on it.
- Calculate the distance AC and find the average speed of the boat.
- The boat travels towards B from C and moves to D. If $DB = 25\text{ km}$, find the bearing of A from D to the nearest degree.

6. The following table represents the information collected on the number of tourists who visited a tourist resort during each day of last November.

Class Interval (Number of tourists)	15 - 23	24 - 32	33 - 41	42 - 50	51 - 59	60 - 68	69 - 77
Number of days	3	5	5	4	6	3	4

- What is the modal class?
- Find the mean number of tourists visited the tourist resort daily.
- By considering the arrival of tourists as above, if the tourist resort receives 20 Dollars as the daily income of one tourist, find the expected income for the next 50 days in Sri Lankan Rupees. (1 Dollar = Rs. 360)

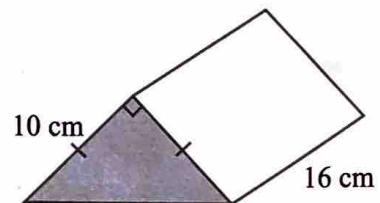
PART B

• Answer 5 questions only.

7. (a) A bodybuilding competitor is prescribed to have a supplement drink in a way such that 15 ml on the first day, 20 ml on the second day and on each day 5 more milliliters than the previous day.
- Show that the amount of supplement the competitor has to take on the n^{th} day is given by $T_n = 5(n + 2)$.
 - On which day does the competitor have to take 80 ml of supplement?
 - Show that 2.5 l of supplement is not enough for 30 days.
- (b) When the 7th term of a geometric progression with first term 48 and common ratio $\frac{1}{2}$ is T_7 , show that $T_7 < 1$.

8. i) Construct the isosceles triangle ABC such that $AB=BC=5$ cm and $\angle B = 120^\circ$.
- Construct a perpendicular from C to AB produced and name the foot of the perpendicular as D.
 - By taking B as the centre and BD as the radius, draw a circle.
 - Produce the side CB and name the point it meets the circle as E. Join AE. Name the point of intersection of AE produced and CD as F.
 - Give reasons for AF touching the circle at E.
 - Name the circle according to the triangle ACF.

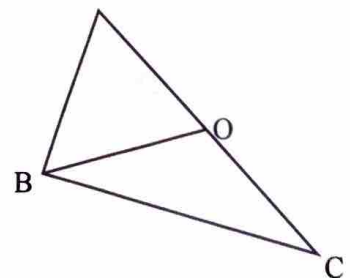
9. (a) The figure shows a solid metal prism with a right angled triangular cross section. By melting it, 4 identical solid metal cylinders of diameter a cm and height 5 cm are made. Here $x \text{ cm}^3$ of metal was wasted.



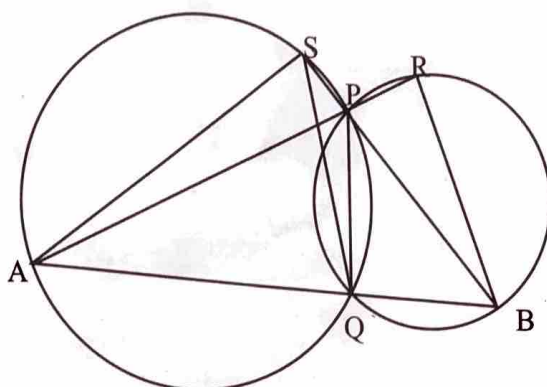
Show that $a = \frac{800-x}{5\pi}$ and find the diameter (a) by taking $x = 30 \text{ cm}^3$ and $\pi = \frac{22}{7}$

- (b) If $x = 0.675^3$, find the value of x using logarithmic table

10. In the triangle ABC, the angle bisector of $\angle B$ intersects the side AC at O. The line drawn parallel to BC through A meets BO produced at D. $BO = OD$.
- Copy the given figure in your answer script and include the above information.
 - Prove that $\triangle BOC \cong \triangle AOD$
 - Show that ABCD is a rhombus.
 - The side BC is produced to E such that $BC = CE$. Show that areas of $\triangle ABC$ and $\triangle DCE$ are equal.

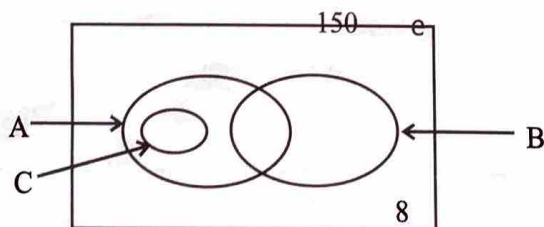


11.



Two circles intersect at P and Q as shown in the figure. AP and BP are two diameters. AP and BP produced intersect the circle at R and S respectively. Show that AQB is a straight line and $\widehat{SQR}$ is bisected by PQ.

12. The following Venn diagram provides information about 150 people who came to a post office for several purposes.



- All those who bought stamps have not sent money orders.
- All those who bought stamps have sent letters.

- Name the sets A, B and C
- If 118 people have posted letters, 45 people have sent money orders and the number of people who bought stamps and posted letters was 85, include these data in the Venn diagram.
- How many people came only to post letters?
- It was later revealed that 5 people who bought stamps didn't post the letters. According to the new data, draw the relevant Venn diagram and mark the information in it.