

සියලු ම හිමිකම් ඇවිරිණි
All Rights Reserved

දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Department of Education, Southern Province
දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Department of Education, Southern Province
දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Department of Education, Southern Province
දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Department of Education, Southern Province

තෙවන වාර පරීක්ෂණය 2020
Third Term Test, 2020

II ශ්‍රේණිය
Grade 11

MATHEMATICS - I

පැය දෙකයි
Two hours

- Answer all the questions in this paper it self.
- 2 marks for each correct answer for the questions 1 - 25 in part A and 10 marks for each question in part B.

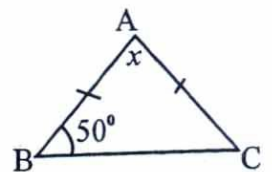
PART - A

01. Last month's electricity bill of Manoja's house was Rs. 4500. If 8% of value added tax (VAT) is added to that bill and the final value of the bill was calculated. Find the VAT charged for the bill.

02. Find the factors $x^2 - 7x - 18$

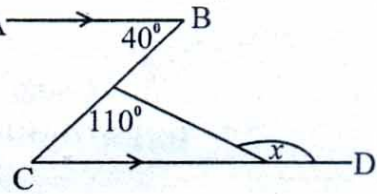
03. Write $\log_3 81 = 4$ in logarithmic form.

04. In this figure $\hat{ABC} = 50^\circ$ and $AB = AC$. Find the magnitude of \hat{BAC} .

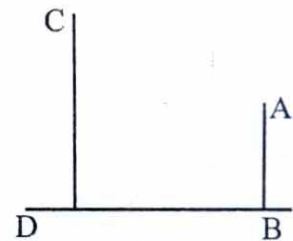


05. Capacity of a water tank is 960 l. A water pump takes 12 minutes to fill that water tank completely. Find the rate at which water flowed out through the pump.

06. In this figure $AB \parallel CD$. Using the given data find the value of x .



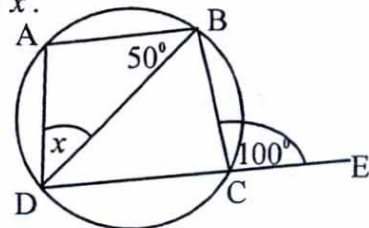
07. The figure shows AB and CD vertical posts on a horizontal ground. The angle of depression of A from C is 28° and the angle of elevation of C from B is 52° . Represent this data in the given figure.



08. Find the least common multiple of the 3 algebraic terms $6a^2$, $12ab$, b^2 .

09. Simplify, $\frac{2}{x} + \frac{1}{3x}$

10. In this figure $\widehat{BCE} = 100^\circ$ and $\widehat{ABD} = 50^\circ$. Find the value x .



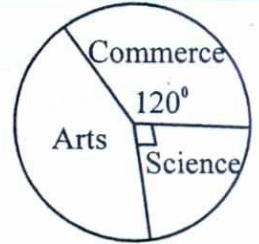
11. Write down the set of integral solutions which satisfy the inequality $3x + 2 \leq 11$.

12. Find the common ratio of the geometric progression where the first term is 4 and 10^{th} term is 2^{11} .

13. Fill the blanks of the below statement using suitable mathematical terms.

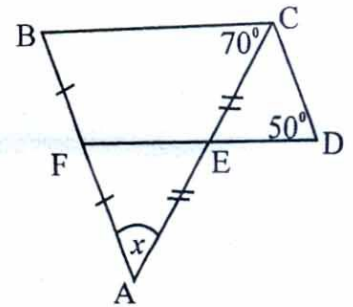
In a parallelogram are equal. By the each diagonal the of the parallelogram is bisected.

14. This pie chart represents the number of students who follow Commerce, Science and Arts streams. If the number of students who follow commerce stream is 60. Find the number of students who follow Arts stream.



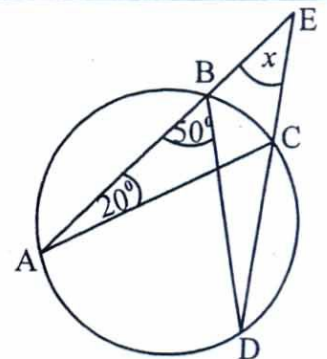
15. Thamara borrowed a loan of Rs. 5000 at a monthly simple interest and at the end of the month. She paid Rs. 5200 to settle the loan. Find the monthly simple interest rate.

16. In this figure mid points of AC and AB are E and F respectively. $AB \parallel CD$, $\hat{FDC} = 50^\circ$ and $\hat{BCD} = 70^\circ$. Find the value of \hat{FAC} .



17. Solve, $3x^2 - 27 = 0$

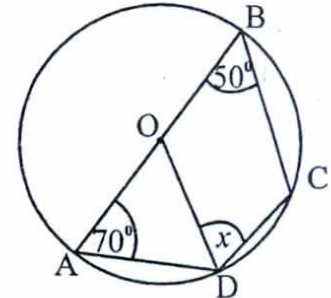
18. AE and DE are straight lines and other data are mentioned in the figure. Find the value of x .



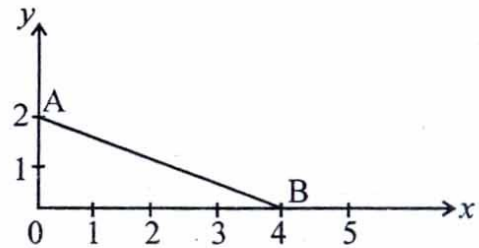
19. Base radius and the curved surface area of a solid right circular cylinder are 7cm and 660cm^2 respectively. Find the height of the cylinder.

20. A and B are finite sets. If $n(A) = 8$, $n(B) = 10$ and $n(A \cup B) = 12$. Find the value of $n(A \cap B)$.

21. Centre of this circle is O and AB is a diameter. Using the given data in the figure find the value of x .

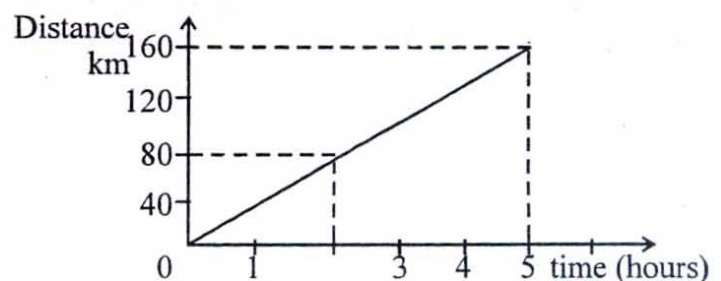


22. Find the gradient of the straight line AB.

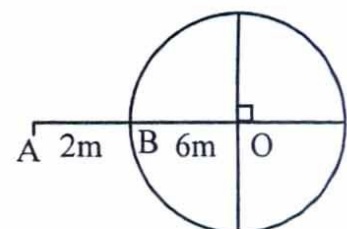


23. In a container there are 8 red colour identical balls and a certain number of white colour identical balls. When a ball is taken out randomly from the container, the probability of getting a red colour ball is $\frac{2}{5}$. Without changing the number of balls in the container /another 4 white colour balls are added to the container and another ball is taken out randomly. Find the probability of getting a red colour ball.

24. The motion of a vehicle is represented by the distance time graph. Find the average speed of that vehicle.



25. This figure shows the locus of the point which is moving 6m constant distance away from the point O. Draw a sketch in this figure to find the locus of points which is moving 12m away from A and on the circle.

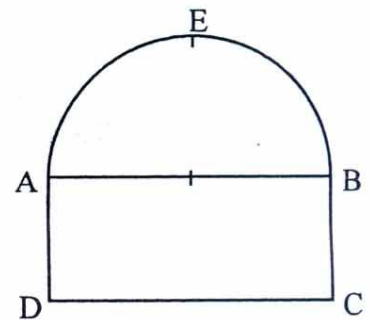


PART - B

-
- (01) A farmer used machines to cultivate the paddy. First day $\frac{5}{12}$ of the whole paddy field was cultivated and $\frac{3}{7}$ of the remaining was cultivated on the 2nd day.
- (i) At the beginning of the 2nd day which portion was left in the paddy field to cultivate.
- (ii) On the second day which portion of the paddy field was cultivated.
- (iii) If the area of the remaining paddy field was 24000m^2 , Find the area of the whole paddy field.
- (iv) To cultivate the remaining part 2 machines took 2 hours. Find how many machine hours will take to cultivate the whole paddy field.
-

- (02) This figure shows the foundation of a hotel. It consists of a AEB semi circular part and ABCD rectangular part. $AB = 25\text{m}$. (Take $\pi = \frac{22}{7}$)

- (i) Find the arc length AEB.
- (ii) Find the area of the semi circular part.



(iii) If the area of the rectangular part is twice the area of the semi circular part find the breadth of the rectangular part.

(iv) It is needed to fix concrete pillars in the whole foundation with 2m gap in between the pillars to build the hotel. Find how many concrete pillars are needed for that.

(03) (a) (i) The assessed annual value of a house is Rs. 40000. If the municipal council charges 8% of the value of the house as rates calculate the rates that need to be paid for a quarter.

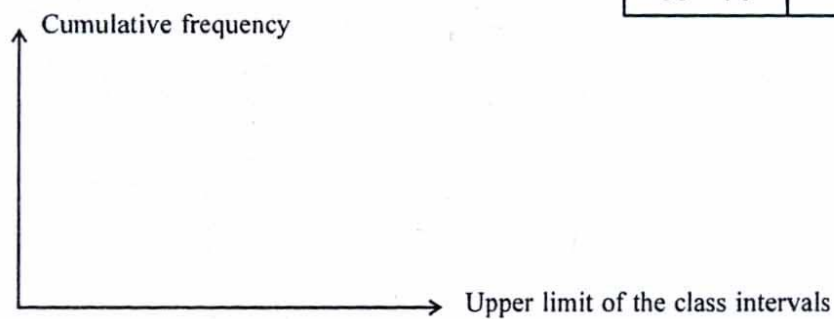
(ii) With the development of that area the municipal council increased the assessed annual value of the properties in that area. But the rates percentage not changed. If the present rates for a quarter for the above house is Rs. 960 find the new assessed annual value of the house.

-
- (b) When vehicles are imported 40% of the imported price of the vehicle is charged as the duty. If the duty of a vehicle is Rs. 800000 find the imported price of the vehicle.

-
- (04) The below table shows the marks scored by Grade 11 students in a certain school for a mathematics test. (20 - 30 represents marks 20 or greater than 20 but less than 30)

Class intervals (marks)	Number of students (frequency)	Cumulative frequency
0 - 10	10	10
10 - 20	14	24
20 - 30	30	54
30 - 40	14
40 - 50	06
50 - 60	04	78
60 - 70	02	80

- (i) Fill in the blanks of the table.
- (ii) Draw the cumulative frequency curve on the given cartesian plane and find the median mark of the distribution.

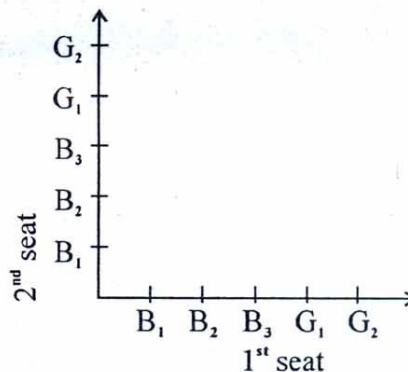


- (iii) If 25% of the students those who got highest marks were separated and other students were assigned for a remedial programme, find the cut off marks for this.

(05) (a) In a bus all the seats were filled with elders. 3 boys and 2 girls were standing and travel in that bus. At the next bus stop two elders got down from the bus and no one else got in to that bus.

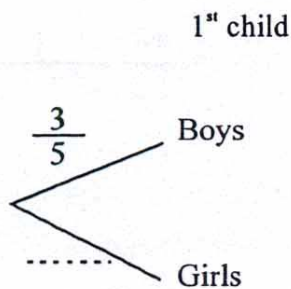
(i) If 2 of the children who were standing can sit on the seats, represent the sample space on the given grid using the sign 'X'.

B_1, B_2, B_3 shows the 3 boys and G_1, G_2 shows the 2 girls.



(ii) Encircle the event which those who are seated, both are boys or both are girls and find the probability.

(b) At the next bus stop a child got down and another child got down at the other bus stop. A part of a tree diagram to show the probabilities of this event is given below.



(i) Complete the tree diagram by stating the probabilities.

(ii) Using the tree diagram find the probability of those who got down both are boys or both are girls.

තෙවන වාර පරීක්ෂණය 2020
Third Term Test, 2020

II ශ්‍රේණිය
Grade 11

MATHEMATICS - II

පැය තුනයි
Three hours

Instructions

- Answer 10 questions by selecting 5 questions from part A and 5 questions from part B.
- Each question carries 10 marks.
- Volume of a cone with base radius "r" and perpendicular height "h" is $\frac{4}{3} \pi r^2 h$.
- Volume of a sphere of base radius "r" is $\frac{4}{3} \pi r^3$.

PART - A

- (01) Mr. Karunasena is a retired person. He deposited Rs. 100,000 in a bank which pays an annual simple interest rate 15% and another Rs. 100,000 he invested to buy shares when the market price of a share is Rs. 50 and the annual dividends income per share is Rs. 5.
- (i) Find the interest he will receive from the bank at the end of the year.
- (ii) At the end of the year he sold all the shares and the total amount he received from that and annual dividends income is Rs. 15,000 more than the amount he received as the interest from the bank. Find the selling price of a share.

- (02) An incomplete table to draw the graph of the function $y = x^2 - 2x - 2$ is given below.

x	-2	-1	0	1	2	3	4
y	6	1	-2	-2	1	6

- (i) Find the value of y when $x = 1$.
- (ii) Using a suitable scale draw the graph of the given quadratic function in a graph sheet.
- (iii) Write the range of value of x where the function increasing and the function is if in the range $-2 < y \leq 6$.
- (iv) Express the given function in the form $y = (x - a)^2 + b$ where a and b are 2 numbers.
- (v) Using the graph write down the positive root of $x^2 - 2x - 2 = 0$ and find the value of $\sqrt{3}$ to the 1st decimal place.

(03) (a) Total cost of 2kg of sugar and 3kg of dhal is Rs. 720. Price of 1kg of dhal is Rs. 15 more than the price of 1kg of sugar. By taking price of 1kg of sugar as Rs. x and 1kg of dhal as Rs. y build up a pair of simultaneous equations and by solving it find the values of x and y .

(b) Price of an apple and an orange of 2 shops A and B are given below.

Shop A : Rs. 40 , Rs. 55

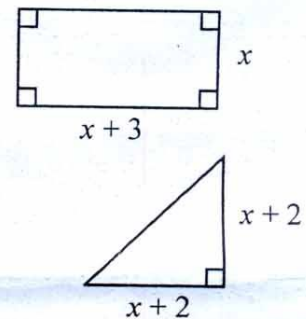
Shop B : Rs. 45 , Rs. 50

(i) Represent the above data by a 2×2 matrix where the columns represents the shops.

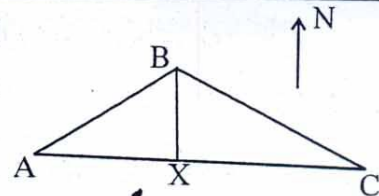
(ii) Mr. Kumara wants to buy 20 apples and 30 oranges. Represent this quantity in a 1×2 matrix and take the product of the above two matrices.

(iii) Using the above answer and by giving reasons state which shop is more profitable for Mr. Kumara.

(04) The following figure shows a rectangle of length $(x + 3)$ units and breadth x units and a right angled triangle with the given measurements. If the area of the above 2 plane figures are equal show that x satisfies the quadratic equation $x^2 + 2x - 4 = 0$ and by giving reasons show that x can take only one value. By taking $\sqrt{5} = 2.2$ find the length of the rectangle to the first decimal place.



(05) A, B and C are three points which are located on a horizontal ground. The bearing of C from B is 125° and $BC = 50\text{m}$ point A is located due west of C and $\hat{BXC} = 90^\circ$.



- Copy the given figure in your answer sheet and include the given data in it. Using the trigonometry tables,
- Find the length of BX to the nearest metre.
- If $AB = 40\text{m}$ Find the value of \hat{BAX} .
- Find the bearing of B seen from A.

(06) The below frequency distribution shows a collection of data regarding the time period of 50 calls taken by Mr. Ranil during a certain day. (10 - 20 means 10 or more than 10 but less than 20)

Time duration of the call (seconds)	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of calls (frequency)	8	10	20	6	4	2

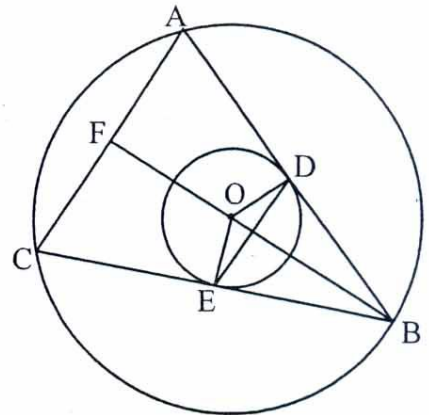
- Using the given data find the mean time of a call to the nearest second.
- If Rs. 1.20 charged for a call up to the class interval which the mean time is include and for other calls there after charged Rs. 2.40 . Find the total cost for the 50 calls took by Mr. Ranil.

PART - B

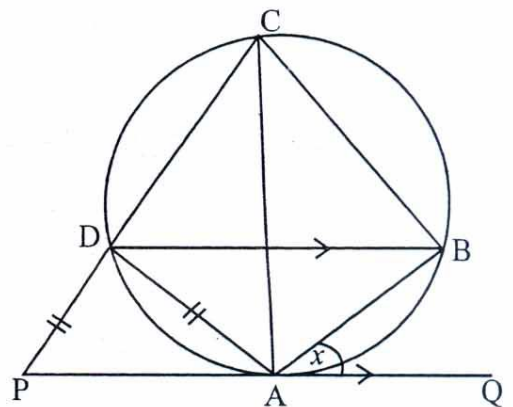
- (07) Fruit plants were planted in Ramindu's land which is trapezium shaped. Such that 1st rows consist of 4 plants, 2nd row consist of 7 plants and 3rd with 10 plants. Number of plants in each row are in an arithmetic progression.
- (i) Find the common difference of this arithmetic progression.
 - (ii) How many plants were planted in the 10th row.
 - (iii) If the plants were planted only up to the 10th row how many plants were there in total.
 - (iv) Ramindu predicted that if there were 180 more fruit plants he can plant 05 more rows. Can he fulfill his prediction ? Give reason

- (08) Constructs the following by using only a pair of compasses and a cm/mm straight edged (keep the construction lines clearly.)
- (i) Construct the triangle ABC such that $AB = 8\text{cm}$, $BC = 6\text{cm}$ and $\hat{ABC} = 90^\circ$.
 - (ii) Construct the angle bisector of ACB angle and name the intersection point of that and AB line as O.
 - (iii) Construct the circle which touches AC and BC lines and the centre located on AB.
 - (iv) Construct another tangent from A to the circle other than AC.
 - (v) Name the intersection point of the above tangent and extended CB line as E and find the perimeter of ACE triangle without measuring.

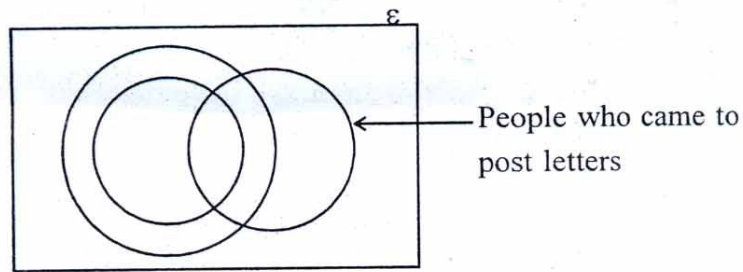
- (09) Centre of the given two circles is O. AB and BC are two chords of the large circle and those 2 chords touches the small circle at D and E respectively. Extended BO line meets AC at F.
- (i) Show that $AC = 2DE$.
 - (ii) Show that $\triangle ABF \cong \triangle BFC$.



- (10) A, B, C and D points are on the circle. PAQ is a tangent drawn at the point A. PQ and BD lines are parallel to each other and extended CD meets PQ at P. $\hat{PAD} = \hat{PD}$ and $\hat{BAQ} = x$.
- (i) Give reasons for $\hat{ABD} = x$.
 - (ii) Give reasons for $\hat{ADB} = x$.
 - (iii) Show that \hat{BCD} is bisected by AC.
 - (iv) Prove that $PD \parallel AB$.



- (11) The below incomplete venn diagram drawn to show a set of information regarding people who came to a certain sub post office during a certain day.



- 50 people came to buy stamps.
 - 15 people came to send telemails
 - 20 people came to post letters.
 - Those who came to send telemails also bought stamps.
- (i) Copy the given venn diagram in your answer sheet and after naming the sets include the above data in it.
- (ii) If 10 people came to bought stamps and to post letters how many people bought only stamps.
- (iii) If only 7 people posted letters how many people bought stamps and sent telemails only.
- (iv) If 75 people came to the sub post office on that day how many people came for other needs.

- (12) A right circular conical shaped container of base radius r and height $2r$ is completely filled with oil. That oil poured in to a right circular cylinder of base radius 7cm and height 21cm. Then half of that cylinder filled with oil. Show that base radius of the conical container is given by $r = 7\sqrt[3]{\frac{9}{4}}$ cm and using logarithm tables find the value of r to the first decimal place.

