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வடமேல் மாகாணக் கல்வித் திணைக்களம்
Provincial Department of Education - NWP

0170

Grade 11 | Second Term Test 2024 | 32 E I

Mathematics I

Index no ..... Time : 02 hours

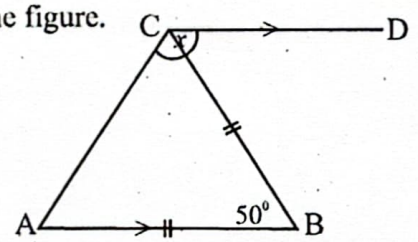
- Answer all the questions on this paper itself.
- Indicate the relevant steps and the correct units when answering the question.
- Each question in part A carries 2 marks and each question in part B carries 10 marks.

Part A

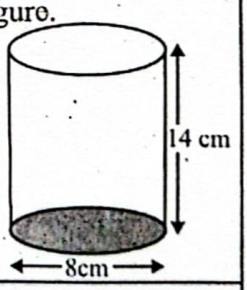
01. If customs duty of 32% of the value of the item has to be paid when a certain type of an electric equipment is imported. How much duty has to be paid when an electric equipment of this type of value Rs.60 000 is imported.

02. Simplify $\frac{5b}{8a} \times \frac{4}{5b}$

03. Find the value of x according to the information given in the figure.

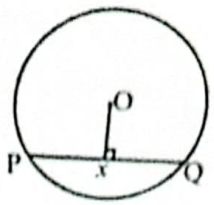


04. Find the area of the curved surface of the right circular solid cylinder in the given figure.



05. Solve $\frac{2x - 4}{3} = 2$

06. The radius of a circle with centre O is 10cm and the length of the chord PQ is 16cm. Find the length of OX, using the information given in the figure.

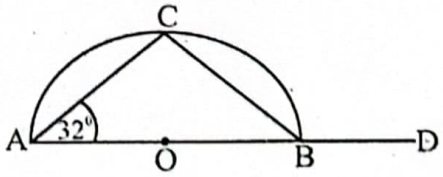


07. Express $2^5 = 32$ in logarithm form

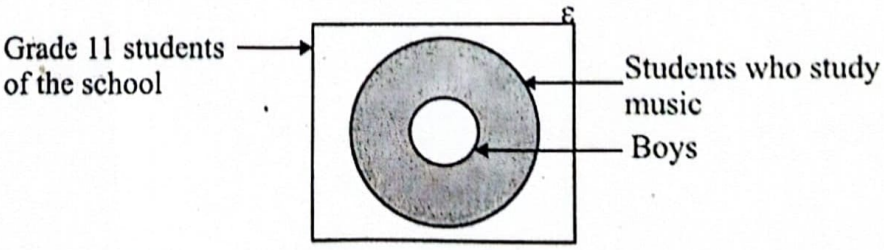
08. Find the first approximation of $\sqrt{11}$

09. Factorize $x^2 - 7x + 12$

10. The centre of the semi circle is O and the diameter AB has been produced to D. Using the information given in the diagram , Find the value of $\hat{CBD}$.



11. Describe the shaded region of the Venn diagram in words.



12. It took 4 men 6 days to harvest a certain paddy field. How many man days are needed to harvest $\frac{2}{3}$ of the paddy field?

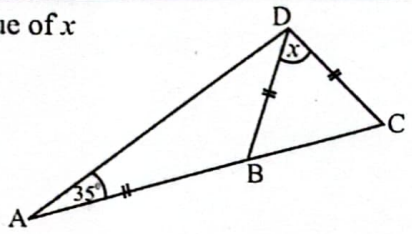
the length

X and Y are not two mutually exclusive events in a sample space.

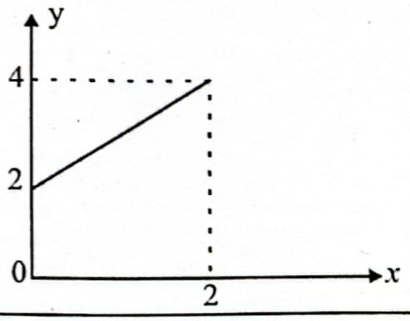
if $P(X) = \frac{1}{3}$, $P(Y) = \frac{1}{2}$ and $P(X \cap Y) = \frac{1}{6}$ Tehn find the probability of $P(X \cup Y)$

14. Write the smallest integer that satisfy the inequality $150x - 25 > 425$

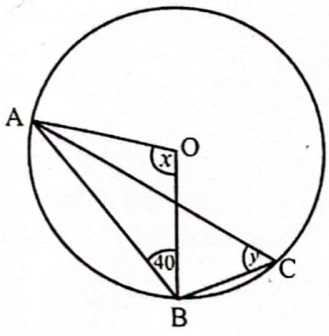
15. Using the information given in the figure, find the value of x



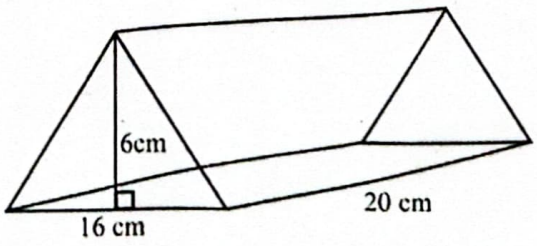
16. What is the
    i) Intercept
    ii) Gradient
    of the straight line given in the figure.



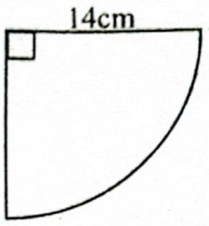
17. The points A, B and C lie on the circle, having centre O, as shown in the figure. Find the value of x and y.



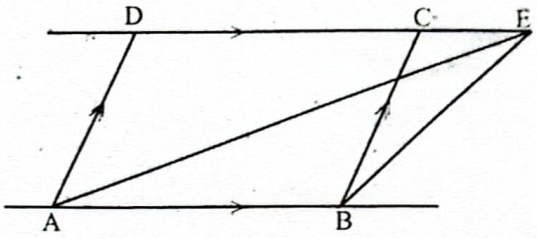
18. Find the volume of the given prism



19. Find the perimeter of the given sector with the radius 14cm



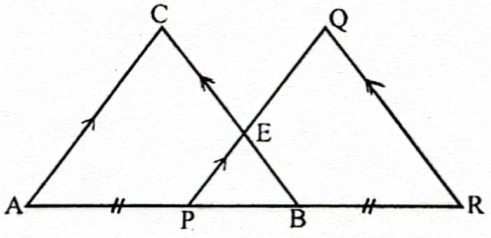
20. According to the given diagram, write the relationship between the area of the parallelogram ABCD and the area of the triangle ABE.



21. Calculate the speed in kilometer per hour of a car which travels 12 km in 15 minutes with uniform speed.

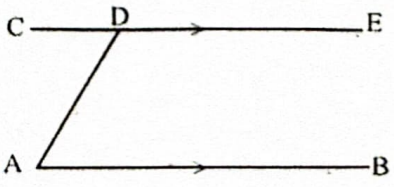
22. Find the least common multiple (LCM) of the following terms.
$4ab^2$, $6a$, $8a^2$

23. Name the pair of triangles that are congruent from the triangles given in the figure and write down the case of congruence.



24. The median is situated in the 12th place of a certain number pattern. Find the place of the first quatile in the same number pattern.

25. According to the given figure, CE is the locus of a point 6cm away from the straight line AB. Draw a sketch of the construction lines that are necessary to find the point X on the line CE which is at an equal distance from the line AB and AD.



Part B

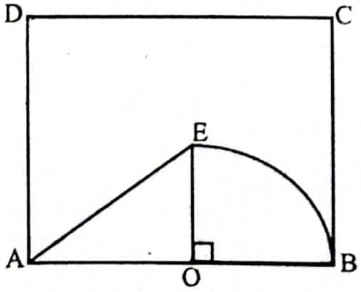
01. Rs. 1000, Rs.500 and Rs.350 worth tickets are printed by the welfare society of a certain institute for staging of a stage drama. Out of the tickets $\frac{2}{5}$ was Rs.500 tickets and $\frac{5}{6}$ of the remainder was Rs.350

(i) Write the number of Rs.350 tickets as a fraction of the total number of tickets printed.

(ii) If the number of Rs.1000 tickets is 100, Find the total number of tickets printed by all three types.

(iii) Calculate the total income hope to gain by selling all the three types of tickets.

02. ABCD is a square shaped metal lamina of the side length 42cm. The ratio of the length AO and OB is 2:1. A right angled triangular shaped part AOE and a sector are cut and removed as shown in the diagram.



(i) Find the radius of the sector

(ii) If the length of AE is 31.3cm. Find the perimeter of the removed portion

(iii) Find the area of the sector

(iv) Find the area of the remaining portion after removing a right angled triangular shaped part and the sector from the square ABCD.

(03) A. Mr. Susantha invested in a certain company which pays annual dividends of Rs.4 per share. His dividends income for a year from this investment is Rs. 8000. After receiving dividends for a year, he sold all his shares.

(i) Find the number of shares Mr. Susantha bought

(ii) He spent all the money he received by selling these shares and dividends income to buy shares in another company. From this investment he gained an annual dividends income which was Rs. 4000 more than what he received from his previous investment.

a} If the second company pays annual dividends of Rs.8 per share, Find number of shares he bought from the second company.

b} The market price at which he bought the shares in the second company was Rs.20 per share. Find the amount Mr. Susantha invested in the second company.

B. Mr.Susantha's house which lies within the limits of a certain municipal council which charges 6% of the assessed annual value of the property as rates, has to pay quarterly rates of Rs.900. What is the assessed annual value of Mr.Susantha's house.

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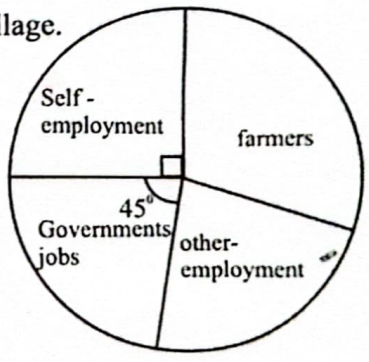
04. a) The pie chart represents information obtained from a 120 people who live in a village, about their employments

(i) Write the number of people who have self employments, as a fraction of the total number of people, who live in the village.

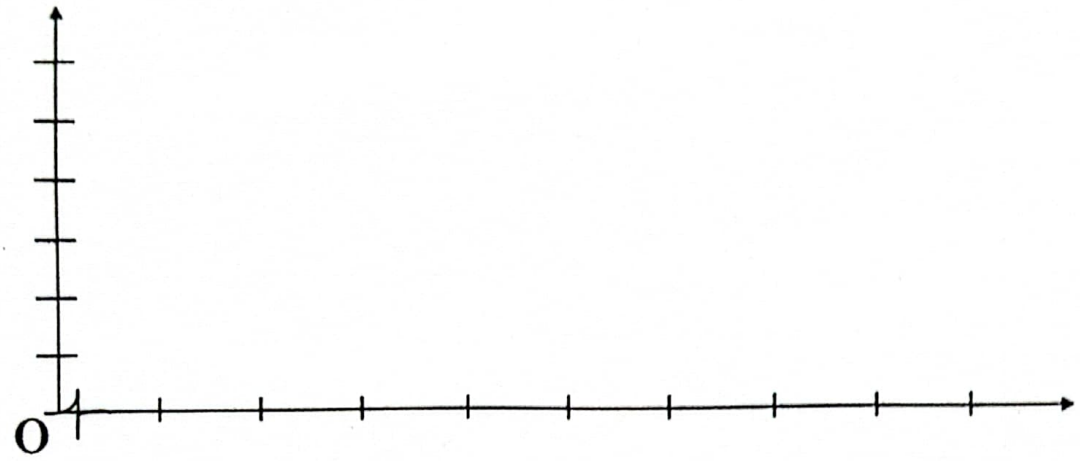


(ii) If 40 farmers are represented by the pie-chart, find the magnitude of the angle at the centre of the sector that represents the farmers.

b) Out of the people who are selected for the above servey the age limits of the farmers are given in the following table.

Age (Years)	20-30	30-35	35-40	40 -45	45-50	50-55
Number of farmer	6	9	12	8	5	10

(i) Using the information in the above table, draw a histogram.



(ii) Draw the frquency polgon on this histogram.

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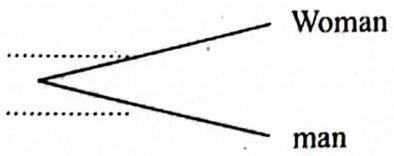
05. a) 4 women and 1 man have participated for the event of snashing the pot in a new year festival. The organizing commitee gives the chance to a woman ora man by selecting randomly.

(i) An incomplete tree diagram to represent this information is given below. Write down the corresponding probabilities on the branches.

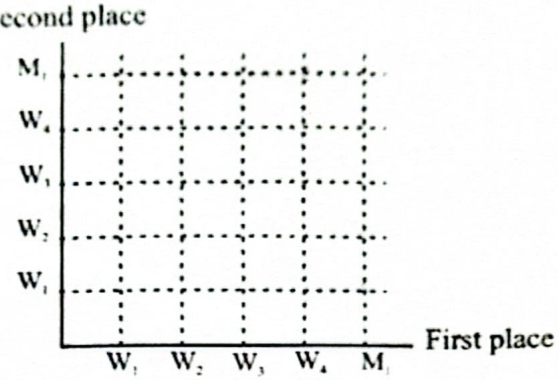
Participating the event



(ii) The organizing commitee said that, the probability that a woman will win the event is $\frac{2}{7}$ and the probability that a man will win the event is $\frac{1}{5}$. Extend the above tree diagram to include the probabilities of win / lose the event by the woman or man and write down the corresponding probabilities on the branches.

(iii) Find the probability that the wining person being a woman or a man.

b) Prizes are given for the first place and the second place of the above event of snashing the pot. An incomplete grid prepared to represent the sample space relevant to the person who selected for the first place and the second place being a woman or a man 15 given in the figure. (w1, w2, w3, w4 represent women and m represents the man)



(i) Indicate the relevant sample space in the given grid using the mark "X"

(ii) Indicate the event of winning the first place by a man and winning the second place by a woman, by encircling it in the grid and write down its probability.

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Provincial Department of Education - NWP
0209

Grade 11	Second Term Test 2024	32 | E | II

Mathematics II — **Time : 03 hours**

Additional Reading time: 10 minutes	Use additional reading time to go through the question paper, select questions and decide on the questions that you give priority to in answering

Important:

- Answer 10 questions selecting 5 questions from **Part A** and 5 questions from **Part B**.
- Each question carries 10 marks.
- The volume of a right circular cone and a cylinder of base radius r and height h are $\frac{1}{3}\pi r^2 h$ and $\pi r^2 h$

Part A

Answer 05 questions only

01. Given below is an incomplete table of values of x and y prepared to draw the graph of the function $y=x^2-2x-1$.

x	-2	-1	0	1	2	3	4
y	7	2	-1	.....	-1	2	7

(i) Find the value of y when x=1
(ii) Draw the graph of the function by taking the standard system of axes and a suitable scale.
(iii) Write the interval of values of x on which the function is negative.
(iv) Express the equation of an image graph the form of $y=ax^2+bx+c$, when keeping a mirror on the straight line $y=(-2)$ as facing to the graph.
(v) Write down the function in the form $y=(x+a)^2+b$, corresponding to the graph obtained when the above graph is translated 3 units in the positive direction of the y-axis and write the values of **a** and **b** .

02. Mr.Dissanayaka has borrowed 30 000 rupees from a certain financial company at an annual interest rate of 12% as promising to settle it within the 2 years. The financial company is charged the interest on the reducing balance.

Mr.Salim also borrowed a same amount of money to the loan amount taken by Mr.Dissanayaka from this financial company at an annual compound interest rate of 12%, and the company calculates the interest end of every six months.

Show that at the end of one year Mr.Salim has to pay 1700 rupees more in interest than Mr.Dissanayaka.

03. a) There are some ripe and raw mangoes in a basket. The number of ripe mangoes are 5 less than three times the number of raw mangoes. If 5 more ripe mangoes are added to that basket, the total number of mangoes in the basket will be 60. Taking the number of ripe mangoes as x and the number of raw mangoes as y construct a pair of simultaneous equations and by solving them, Find separately the number of ripe mangoes and the number of raw mangoes.

b) Simplify

$$\frac{x^2+3x+2}{x+3} \div \frac{x^2-1}{5(x+3)}$$

04. A student has recorded the time he spent to watch the TV programmes within 60days. Given below is a frequency table which includes that information.
(20-25 class interval represents, 20 or greater than 20 and less than 25)

Time(minutes)	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
Number of days	4	5	6	12	10	8	7	8

(i) What is the time interval with the most number of days watching TV programmes?
(ii) Find the mean number of time of this student spent to watch TV programmes per day by taking the assumed mean or any other method.
(iii) Express the number of days more than the mean number of days of this student spent to watch TV programmes, as a percentage from the total number of days.
(iv) Show that more than 43 hours of time exceeding as total time, when the maximum time he has spent to watch TV programmes in every day within these 60 days.

(05) When observing a tower infront from the window in a vertical building with a height of 40m the angle of elevation is 20^0.The horizontal distance between the building and the tower is 60m and the both of the building and tower located in the same vertical plane.

(i) By taking the suitable scale and draw a scale diagram relevant to the above given information.
(ii) Find the height of the tower.
(iii) Find the angle of depression of the bottom of the tower when observing from the window of the vertical building

06. The length and the width of a rectangular vegetable bed are 8m and 4m respectively. Around a vegetable bed, there is a road with the regular width of xm. If the area of the vegetable bed and the road are equal, construct a quadratic equation including x and find the width of the road when simplifying the equation.
(consider $\sqrt{17} = 4.12$)

Part B

Answer 05 questions only

07. Mr.Ishara started to save money in january keeping 500 rupees and there after in every month, it will increase by 250 rupees over the previous month.
(i) Write down the amount Mr.Ishara saved in the first 3 months in order and find the amount he saved in 8 months by using the formula.
(ii) In which month he saved 3000 rupees.
(iii) After he giving 200 rupees in every month to his brother from the money he saved , then he decides to buy a bicycle wroth of 20 000 rupees from the remaining money at the end of a year. Will Mr.Ishara be able to achieve his goal?
Give reasons for your answer.

08. Use only a straight edge with a ***cm/m*** scale and a pair of compasses for the following construction. Show the construction lines clearly.
(i) Construct the triangle ABC such that AB=6.5cm, $A\hat{B}C = 75^0$ and CB = 6.5cm
(ii) Construct the prependicular from B to AC and name the point at which it meets AC as D.

(iii) The point O is located equidistant to the A and B on the same perpendicular in above (ii).Mark the point O.

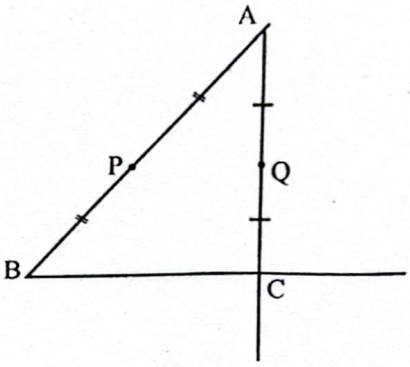
(iv) Construct a circle with centre O and radius OA and name an angle equal to $B\hat{A}C$

09. a) If a right solid cone of a radius r and height three times of its radius is melted and a right circular cylinder of radius a and height 20cm is prepared without any wastage, show that

$$a = \frac{r^{2/3}}{4\sqrt{10}}$$

b) If $r = 7.5cm$ find the value of a to the nearest first decimal place using the logarithms tables.

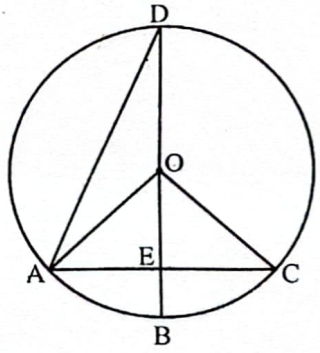
10. In a triangle ABC, the mid points of the sides AB and AC are P and Q respectively. AC produced at G as AQ = CG and BC produced at F as BC = 2CF



(i) Include the above information in the given figure and prove that APQ $\triangle \equiv$ CFG $\triangle$

(ii) Thereby prove that APGF is a parallelogram.

11. A,B,C and D points are on the circle with centre 'O' . Diameter BD is perpendicular to AC chord



(i) By giving the reasons find the values of below given angles.(take $A\hat{C}B = x^0$)

a) $A\hat{O}B$

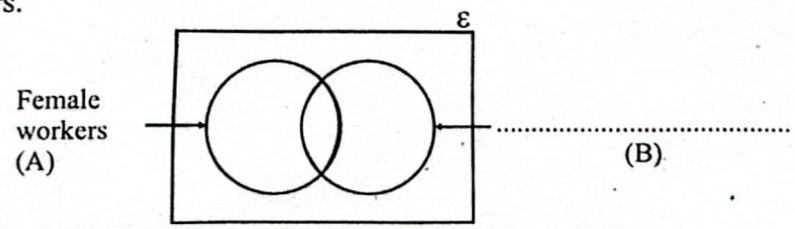
b) $A\hat{D}B$

c) $B\hat{A}D$

(ii) Prove that the triangle ABC is an isosceles triangle.

(iii) Show that $A\hat{O}B = B\hat{D}C$

12. An incomplete venn diagram drawn to represent the information collected from 55 male and female workers who worked in a certain trading company. Out of them 38 are female workers and 37 are married workers.



(i) Copy the given Venn diagram to your answer script and name the set B

(ii) Complete the Venn diagram according to the given instructions

(iii) Give answers relevant to the Venn diagram,

a) Find the married female workers in this company

b) Shade the region belongs to the set of unmarried male workers and express it in the set notation.

(iv) Indicate the number of unmarried workers in this company as a fraction of the total number of workers

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