DE MAZENOD COLLEGE, KANDANA
FIRST TERM TEST 2024
MATHEMATICS I

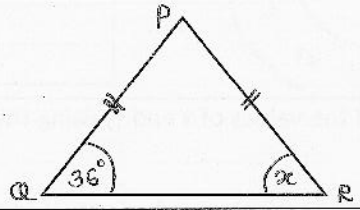
GRADE 11 **2 hours**

Part A

***Answer all the questions**

1. $\sqrt{28}$, write as a surd

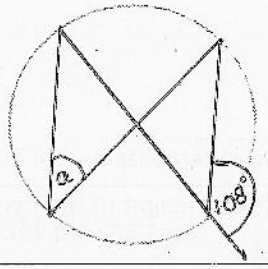
2. Find the value of x in the triangle PQR.



3. lg 7.345 = 0.8660. Find lg 0.0007345

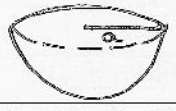
4. Simplify. $\frac{1}{12x} - \frac{1}{4x}$

5. Using the data in the figure, find the value of a



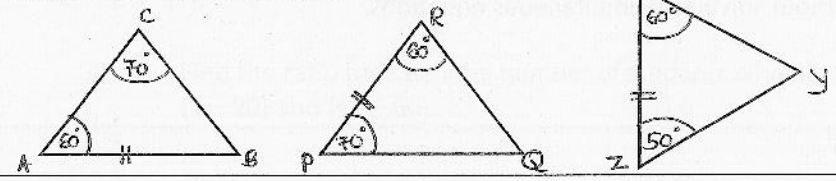
6. Fill in the blanks.
(..... + x)^2 = 9 + ... + ...

7. The radius of the solid hemisphere is a cm. Find the total surface area in terms of π and a (The surface area of a sphere is $4\pi r^2$)



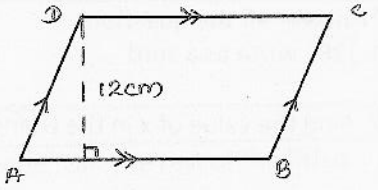
8. Simplify. (x + 2)^3

9. i. Which triangle is congruent to the triangle ABC?
ii. Write the case of congruency.

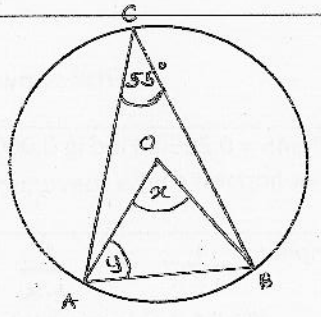


10. 12 men take 8 days to finish a certain work. Find the number of days needed by 4 men to complete half the above work.

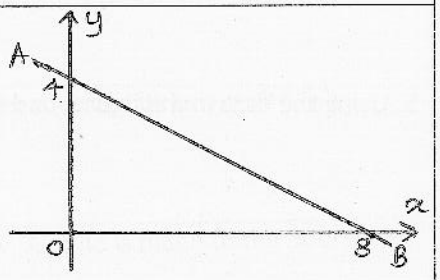
11. The area of the parallelogram ABCD is $180cm^2$. If DE = 12cm, find the length of DC



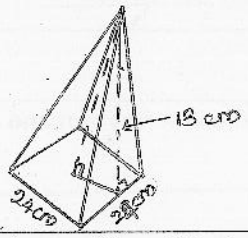
12. Find the values of x and y, using the data given in the diagram.



13. Find the gradient and the intercept of the straight line AB.



14. Find the perpendicular height of the pyramid, using the data given in the square-based pyramid.



15. If the volume of the right circular cylinder with a height of 10cm is $770cm^3$, find the area of its cross-section.(Volume of the cylinder is $\pi r^2 h$)

16. Find the value of (x+y) without solving as simultaneous equations.

$3x + 4y = 15$

$4x + 3y = 20$

3. a. Piyal deposits Rs. 60000 in a certain financial institution at a 12% annual simple interest rate.

i. Find the total interest that he receives at the end of 2 years

ii. Calculate the total amount that he receives at the end of 2 years.

b.

Annual income	Income tax
First Rs. 500000	Free
Next Rs. 500000	4%
Next Rs. 500000	8%

Mr.Silva earns Rs. 875000 annual income from his business and he gets Rs. 45000 for a month from a house which is given on rent.

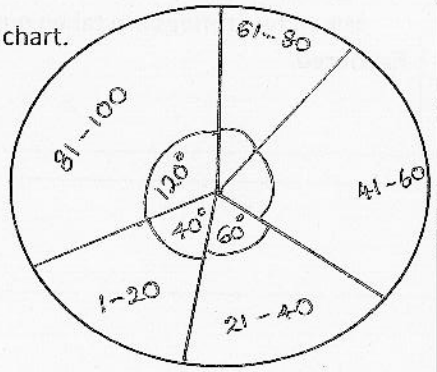
i. Find his annual income.

ii. Caculate the total income tax that should be paid by Mr. Silva according to the table given above.

4. The marks out of 100 obtained by Grade 11 students for a mathematics paper is shown in the pie chart given below.

Complete the table given below, using the data in the pie chart.

Marks	Number of students	Sector angle
1 – 20		
21 – 40	6	
41 – 60	8	
61 – 80		
81 - 100		120



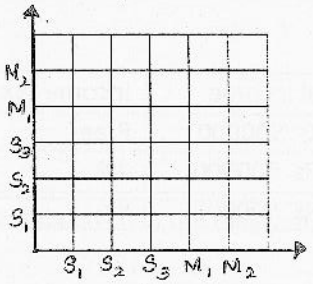
i. Find the total number of students in the class.

ii. 50% of the students obtained high marks. Find the minimum mark that should be used to select the above 50%.

iii. Find the ratio between the number of students who obtained marks in the ranges of (1 – 20) and (41 – 60).

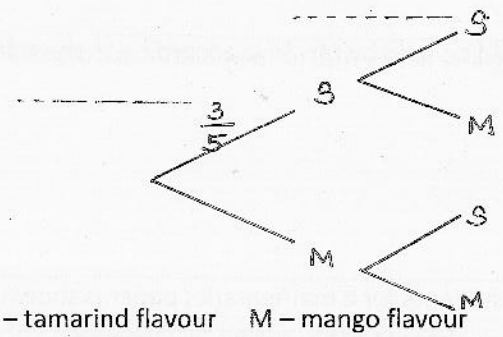
5. There are 5 toffees in a bag. 3 toffees are tamarind flavoured and the others are mango flavoured. A toffee is taken out randomly and checked the flavour, then put it into the bag, and take another toffee.

a. i. Represent the sample space on the given grid, using x mark. (Tamarind flavoured toffee as S_1 ,S_2 ,S_3 and mango flavoured toffee as M_1 ,M_2 are shown)



iii. Encircle the event that both the toffes being the same flavour and find the probability.

b. Complete the given incomplete tree diagram in the above experiment.



S – tamarind flavour M – mango flavour

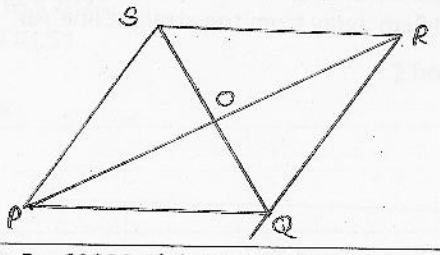
When two toffees are taken out randomly, find the probability of only one toffee being tamarind flavoured.

17. The statements given below are about the parallelogram PQRS. Mark ✓ in front of correct statements and x in front of incorrect statements.

i. $\hat{PSR} = \hat{PQR}$ ( )

ii. PR = 2 OP ( )

iii. $\hat{QPS} + \hat{QRS} = 180^0$ ( )



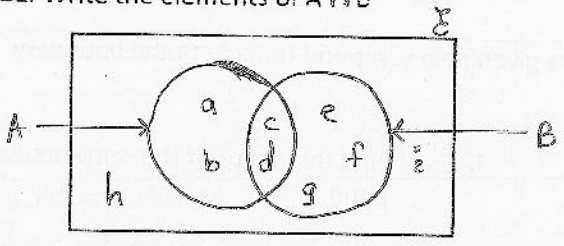
18. A certain municipal council has assessed a shop as Rs. 60000. If the annual rates percentage is 8%, calculate i. the annual rates

ii. the quarterly rates of the shop

19. Find the least common ~~factor~~ multiple of $2x^2$, $12xy$, $3xy^2$

20. The capacity of a tank is 240 ℓ. If the water flows through a pipe at a uniform rate of 8 litres per minute, find the time taken to fill the tank completely.

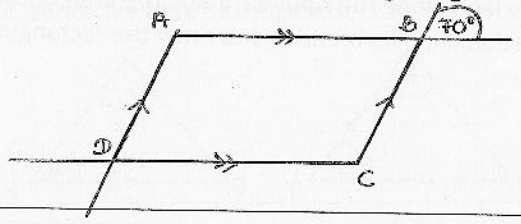
21. Write the elements of $A' \cap B$



22. Find the roots of $x^2 - 9 = 0$

23. Simplify. $\frac{7a}{2b} \times \frac{4b}{21}$

24. Find the magnitude of $\hat{BAD}$, using the given data in the parallelogram ABCD.



25. Using the knowledge of loci and construction, find the location of point P which is 6cm away from point A and 5cm away from the straight line AB.

A _____ B

Part B

1. $\frac{2}{7}$ of the fish that a fisherman Perera caught, is mackerel and $\frac{1}{3}$ is white fish. The rest of the fish is other.

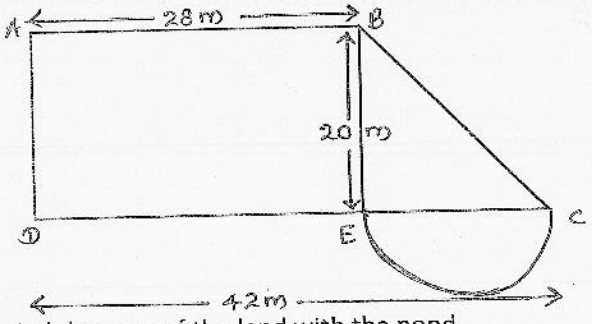
   i. Which fraction out of the fish caught is mackerel and white fish?

   ii. $\frac{1}{8}$ of the remaining fish is spoilt. Therefore those were removed. Which fraction out of the fish caught is spoilt?

   iii. If finally, the mass of fish not spoilt is 45kg, find the total mass of fish caught.

   iv. If 1kg of fish is sold at Rs. 350, find the total amount received by selling the fish.

2. ABCD is a trapezium-shaped land in the figure given below. A pond is made to the boundary CE. Using the data given in the diagram,



   i. Find the radius of the semi-circular pond.

   ii. Find the arc length of the semi-circular portion.

   iii. Find the area of the land with the pond.

   iv. A rectangular portion of land is bought outside the land along the boundary AD. The area of the rectangle is equal to the area of the semi-circular portion. Find its breadth and draw the rectangular portion on the given figure with measurements.

2024-06

DE MAZENOD COLLEGE, KANDANA
FIRST TERM TEST 2024
MATHEMATICS II

GRADE 11 **3 hours**

Part A

- Answer 5 questions from part A and 5 questions from part B
- Volume of cylinder = $\pi r^2 h$ Volume of sphere = $\frac{4}{3}\pi r^3$ Volume of cone = $\frac{1}{3}\pi r^2 h$

1. Ashen has Rs.100000. He expects to buy a motorbike worth Rs.350000 at 20% duty percentage.

i. Find the price of the motorbike with duty.

ii. Find the remaining amount of money that he needs to buy the bicycle.

The remaining amount of money was loaned from a financial institute under 10% annual simple interest rate.

iii. Find the amount of money that should be paid at the end of a year

At the end of the year, he sold the motorbike and paid off the loan and the interest.

iv. If the remaining amount that Ashen has is 30% of the total value of the motorbike, find its selling price.

2. An incomplete table of values prepared to draw the graph of the function $y = \frac{1}{2}x^2 - 1$ is given below.

x	-3	-2	-1	0	1	2	3
y	4.5	1	-0.5	.....	0.5	1	4.5

i. Find the value of the function, when x=0.

ii. Draw the graph of the function, using a suitable scale.

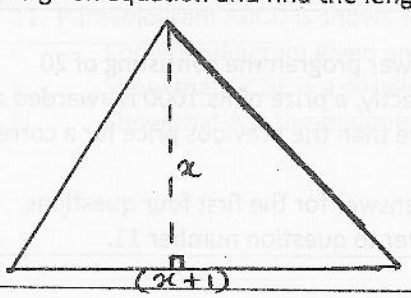
iii. When the graph increases and $-1 \leq y < 3$, write the interval of values of x

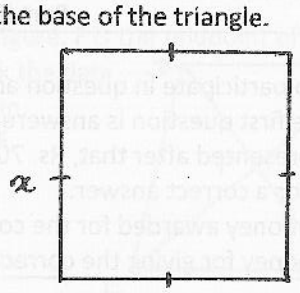
iv. Find the positive root of the equation $\frac{1}{2}x^2 - 1 = 0$

Hence find the value of 2.

3. The sum of the areas of a triangle and a square in the given diagrams below is 12 cm^2. Show that it satisfies the quadratic equation $3x^2 + x - 24 = 0$.

Solve the given equation and find the length of the base of the triangle.





4. The angle of elevation of top Q of the building PQ which is on a flat ground from point A is 40°. AB = 60 m and AP = 2PB,

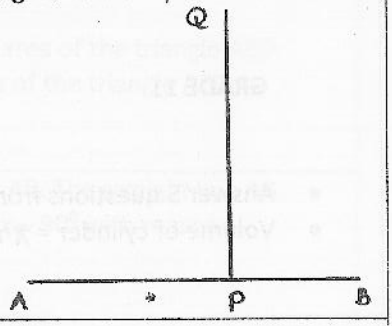
i. Copy the given diagram and include the data on it,

ii. Draw the scale diagram, using the scale 1: 2000.

Using the scale diagram,

iii. Find the height of the building.

iv. Find the bearing of the point B from the top Q of the building.



5. The time duration (in minutes) of 40 people who stayed at a birthday party is given in the diagram below. The 120 – 130 means that greater than or equal to 120 and less than 130.

Time	120 - 130	130 -140	140 - 150	150 - 160	160 - 170	170 – 180
Number of people	5	8	10	11	4	2

i. How many maximum number of minutes that a person stayat the party?

ii. Calculate the meantime to the nearest minute by taking the mid value of the modal class as the assumed mean or any other method.

iii. If the organizer of the party states that only the people who stayed more than the mean time will be invited to the next party, calculate the percentage of the people who will be invited out of the total number of people.

6. a. Samarasinghe and Amarasinghe are neighbours. The number of members in Samarasinghe's family is 2 less than 3 times the number of members in Amarasinghe's family. When 3 members of Amarasinghe's family went abroad, the total number of family members in both families was 11.
Taking the number of members in Samarasinhge's family as x and the number of members in Amarasinghe's family as y, build two simultaneous equations and solve.

b. Solve . $\frac{3}{x+2} - \frac{4}{x-1} = 0$

Part B

7. Kasun is prepared to participate in question and answer programme consisting of 20 questions. When the first question is answered correctly, a prize of Rs.1000 is awarded and for every question presented after that, Rs. 700 more than the previous price for a correct answer is awarded for a correct answer.

i. Write the prize money awarded for the correct answer for the first four questions.

ii. Find the prize money for giving the correct answer to question number 11.

iii. Show that $S_n = 50(13n + 7n^2)$ total prize money will be received for answering up to n^{th} question.

iv. Hence find the total prize money, Kasun can win by answering all 20 questions.

8. Construct using only a straight edge and a pair of compasses.

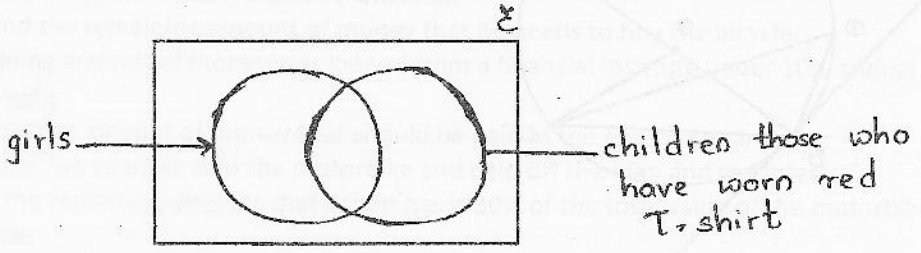
i. Construct the triangle ABC, such that AB = 6cm, $A\hat{B}C = 120^0$ and AB = 5cm.

ii. Construct the bisector of $A\hat{B}C$.

iii. Draw a parallel line through C to AB and name the intersection point of the above bisector and the parallel line as D.

iv. Which type of a triangle is BDC and give reasons.

9. 25 boys out of 100 children who participated in New Year's games wore red T-shirts.



i. Copy the Venn diagram and enter the data into it.

ii. If there are 60 girls, how many children have not worn red T-shirts?

iii. If the number of girls who have not worn red T-shirts is 12 more than half the number of boys, find the total number of children who have worn red T-shirts.

iv.80 out of the participants participated in the game of keeping an eye on the elephant, while all the girls participated. Copy the above Venn diagram again and include the sub-set of the children who participated in the game keeping an eye on the elephant.

v. If 35 children who have worn red T-shirts participated in the game mentioned above, include the new data in the new Venn diagram.

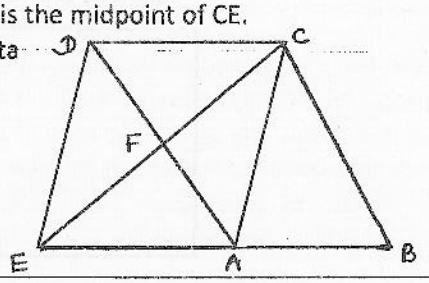
10. A right circular cylinder with base radius a and height 3 times the radius is melted and made a right circular cone with radius $\frac{h}{2}$ and height h and a solid sphere of diameter 2a without a wastage. Show that $a = \frac{h}{2\sqrt{20}}$. Take h = 19.56 and find the value of a to the nearest first decimal place, using the logarithms table.

11. Parallelogram ABCD is shown in the figure. F is the midpoint of CE.

i. Copy the diagram given and mark the data

ii. Show that ACDE is a parallelogram.

iii. Show that A is the midpoint of BE.



iv. Show that the area of the parallelogram ABCD = 2 times the area of the triangle AED

v. Show that the area of the trapezium EBCD = 3 times the area of the triangle AED

12. AB is the diameter of the circle with centre O. DBC is bisected by AB. The straight line AB touches the circle at B. OC ⊥ PQ. Take OCB = x and show OCD = $2x - 90^0$ with reasons.