De Mazenod College, Kandana
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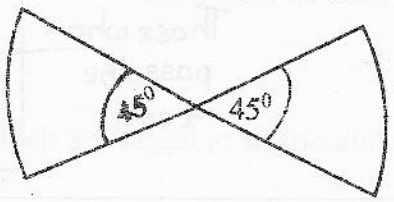
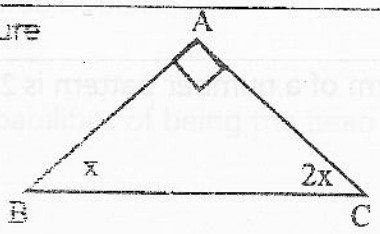
MATHEMATICS I

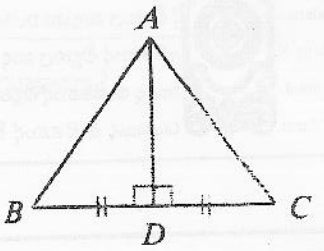
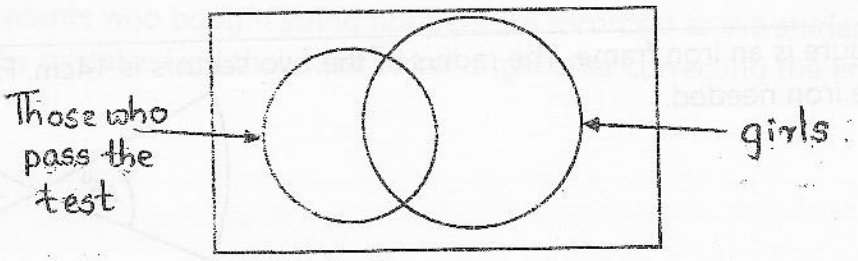
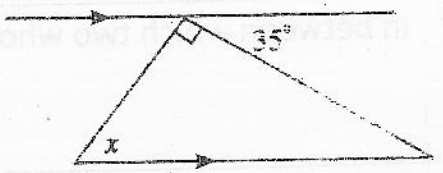
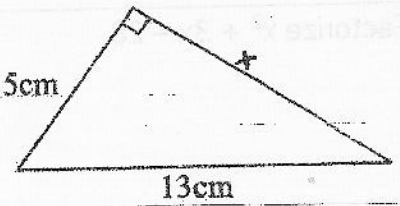
FIRST TERM TEST 2024 | **GRADE 10** | **2 hours**

06. 2024

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

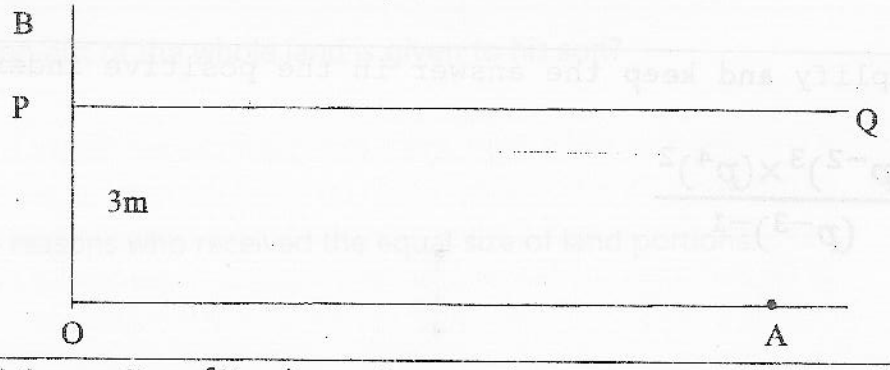
Part A

01	If a vendor expects to sell an item which was bought at the price of Rs.1250, with a 25% of profit, Find the selling price of the item.
02	The given figure is an iron frame. The radius of the two sectors is 14cm. Find th total length of the iron needed. 
03	In between which two whole numbers $\sqrt{80}$ is located.
04	Find the value of x, using the data in the figure 
05	Simplify $\frac{3x}{7} + \frac{2x}{3}$
06	Solve $\frac{2-x}{5} + 7 = 6$
07	Factorize $x^2 + 3x - 28$

08	Write the case that ΔABD and ΔACD are congruent. 
09	Fill in the blanks $(3x + \ldots\ldots)^2 = 9x^2 \ldots\ldots + 64$
10	The information on the students who pass a mathematics test is shown in the Venn diagram below. Shade the region which represents the the boys who fails the test. 
11	Find the value of x, using the information in the figure 
12	The general term of a number pattern is 25-3n. Find the first two terms.
13	There are orange flavoured and milk flavoured toffees in a box. The number of orange flavoured toffees is 7 and the probability of getting an orange flavoured toffee is $\frac{1}{2}$. Find the number of milk flavoured toffees.
14	Find the least common multiple of 24,18, 36
15	Find the length of the side of the triangle, shown in x 

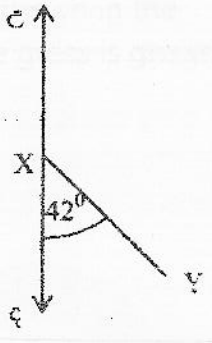
16 A broker charges 3% of commission for selling a land. If a commission of Rs.75000 is received for selling a land, what is the selling price of the land.

17 PQ is a locus of a point which moves 3m away from OA. Using the knowledge on loci, find the point T which is on the above locus and moves equi-distant to O and A



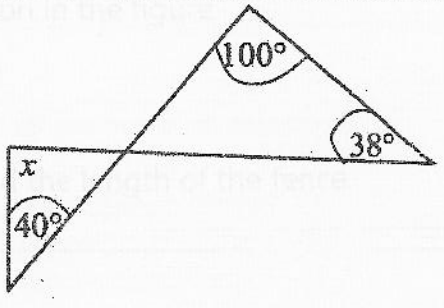
18 Find the mode and the median of the data collection given.
13, 15, 12, 17, 18, 19, 20, 16, 15

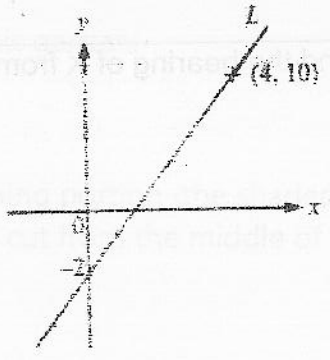
19 Find the bearing of X from Y



20 Factorize. $4x^2 - 49$

21 Find the value of x



22	Find the value of x. $5x + y = 10$ $2x - y = 4$
23	Simplify and keep the answer in the positive index. $\frac{(p^{-2})^3 \times (p^4)^2}{(p^{-3})^{-1}}$
24	Solve the given inequality and represent the solutions on a number line $4x - 7 > 13$
25	Find the equation of the given straight line in the graph. 

Part B

1. Mr. Nimal gave $\frac{1}{3}$ of a land which belongs to him to his wife, $\frac{2}{9}$ to his daughter and $\frac{1}{2}$ of the remaining land to his son. The rest of the land is kept for himself.

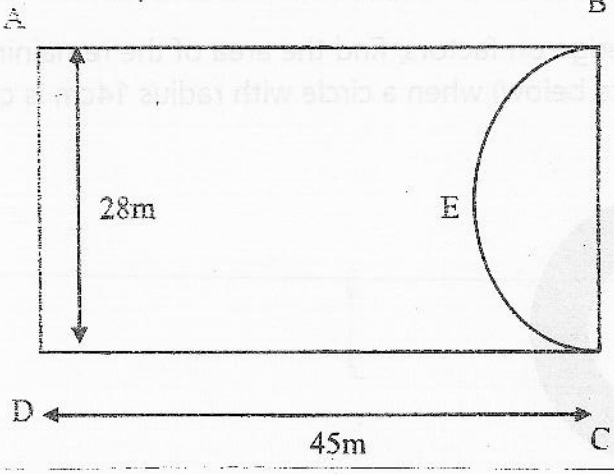
   i. Which fraction out of the whole land is given to his wife and to his daughter?

   ii. Which fraction out of the whole land is given to his son?

   iii. Explain with reasons who received the equal size of land portions.

   iv. If the difference between the sizes of the land which Wife and Mr. Nimal had is 25 perchaces, find the number of perchaces in the intitial land that Mr. Nimal had.

2. A garden which consists of a rectangle ABCD and a semi circle BEC is shown in the figure.The semi circular portion is a pond and in the rest of the land the grass is grown



   i. Find the arc lenght of the pond, using the iformation in the figure.

   ii. If a protective fence is made around the pond. find the length of the fence.

iii. The pond is completely covered by algae, Find the area that the algae is spread.

iv. Find the total amount of money needed to grow grass in the land where the grass is grown, if Rs. 750 is spent for $1m^2$ to grow grass.

v. It is expectd to add a right angle triangular shaped flower bed which is equal in area of the pond. One boundary which contains the right angle is AD. The other one is on the opposite direction of C on produced AD and take that length as DF.Find the length of DF and draw the flower bed on the given diagram with measurements.

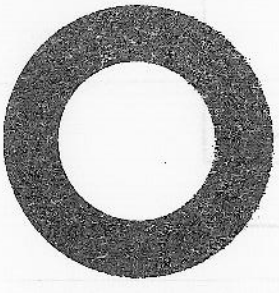
3. The area of the square shped land is $650.25m^2$.

a.

i. Find the length of a side of the garden.

ii. Find the total distance when a man runs 7 rounds in this garden.

b. Using the knowledge on factors, find the area of the remaining portion (the shaded region in the given figure below) when a circle with radius 14cm is cut from the middle of a circle with radius 21cm.

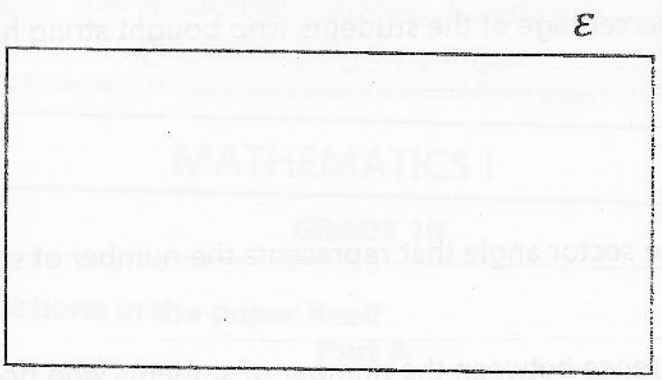


4.

a.

i. Represent the given sets in the Venn diagram below

ε - {whole numbers from 1 to 12}
A - { prime numbers from 1 to 12}
B - { odd numbers from 1 to 12}



ii. Write the elements of $A \cap B$

iii. Find $n(A \cup B)$

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

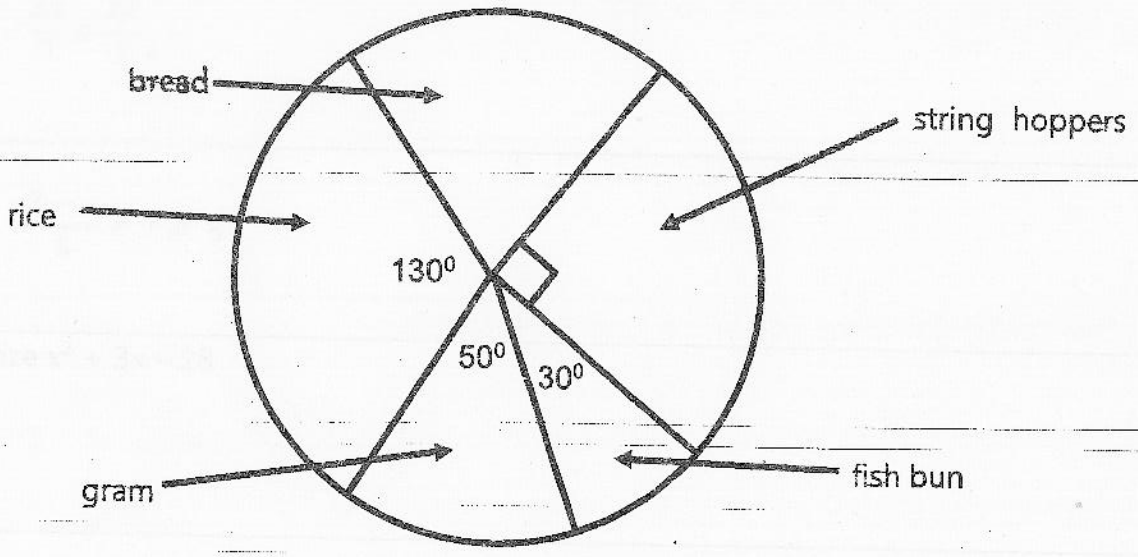
b. There are 3 red beads, 4 blue beads and 5 black beads which are equal in shape and size in a bag. A bead is randomly taken out of the bag.

i. Find the probability of the bead being red

ii. Find the probability of the bead being blue or black.

iii. Wirte the relationship between the probabilities of being the bead red and being the bead blue or black?

5. The information of food which is bought from a canteen in a certain school during an interval is represented in the pie chart given below.



DE MAZENOD COLLEGE, KANDANA
FIRST TERM TEST 2024
MATHEMATICS II

GRADE 10 **3 hours**

*Answer 5 questions from part A and 5 questions in part B

PART A 06 - 2024

1. a) A carpenter makes a cupboard worth Rs. 40000 and sells it to a vendor keeping 25% profit. The vendor marks its price with a 30% profit to the buying price. When it is sold, a 5% discount is given.
Explain with reasons who earns greater profit the vendor or the carpenter.

   b) Sunil gets Rs. 33950000, after giving a 3% commission to a broker for selling his vehicle. Find the selling price of the vehicle.

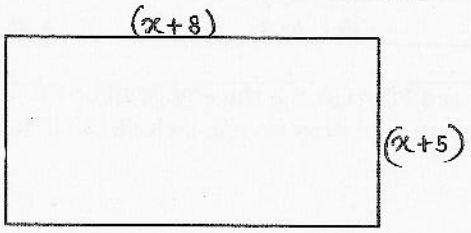
2. A table of values prepared to draw a function $y = 3x - 2$ is given below.

x	-2	-1	0	1	2	3
y	-8	-5			4	7

   i. Fill the blanks in the table.
   ii. Write the gradient and intercept of the above graph.
   iii. Draw the graph of $y = x$ on the same graph paper and write the coordinates of the intersection of the two straight lines.

3. The ship B is anchored 65km from the habour A with a bearing 070^0. Ship C is 75km away from B and with a bearing 150^0.
   i. Draw a rough sketch and represent all the data given.
   ii. Draw a scale diagram, using the scale 1:1000
   iii. Find the distance between ships A and C and the bearing of C from A, using the scale diagram.

4. The price of 3 mangoes and 5 oranges is Rs. 1110. The price of 7 mangoes and 5 oranges is Rs.1590. Take the price of a mango as a and the price of an orange as b and build up two simultaneous equations.
Solve them and find the values of a and b.

5. 

i. Write an algebraic expression for the area of the rectangle.

ii. If the area of the above rectangle is reduced by 10units, write an algebraic expression for the new rectangle.

b) Factorize

i. $2x^2 - 30 - 7x$

ii. $8y^3 - 450y$

6. The masses of bags of rice are given in the table below

Mass of a bag (kg)	20	21	22	23	24	25	26
Number of bags	2	4	5	15	5	6	3

i. What is the mode of the above data collection?

ii. What is the median?

iii. Find the mean mass of a bag to the nearest kg.

iv. Estimate the mass of such 75 bags.

PART B

7. The bulbs in a pandol are fixed such as in the first row 5 and in each of the rows after has 4 more than the previous row.

i. Write the number of bulbs in the first three rows and build up the general term of the pattern.

ii. How many bulbs are there in the 12^{th} row?

iii. In which row has 101 bulbs?

iv. What is the minimum row that has over 60 bulbs?

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

i. Draw the triangle ABC such as AB = 8cm, AC = 6cm, and $A\hat{B}C = 60^0$.

ii. Construct the two exterior angles by producing the two sides AB and AC.

iii. Draw the angle bisectors of the above exterior angles and mark the intersection point as O.

iv. Draw the perpendicular from O to the opposite side BC and name the intersecting point of the side BC as P.

v. Taking the centre as O and the radius as OP, construct the circle.

9. In the triangle PQR is a right angled and PQ = QR. S is the any point on PR. The perpendiculars drawn to produced QS are PX and RY. Draw a diagram and include the data in it. Show that,

i. $Q\hat{R}Y = X\hat{Q}P$

ii. $\triangle PQX \equiv \triangle QRY$

iii. PX = QY

iv. Show that the length of XY is equal to the difference of the lengths PX and RY.

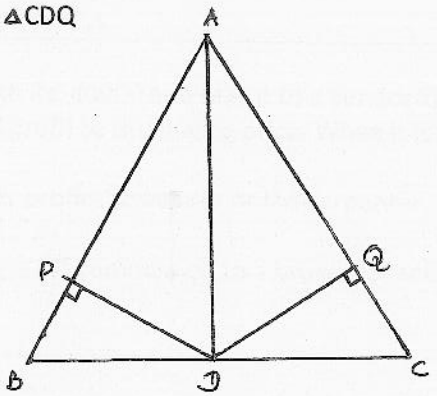
10. AD is the angle bisector of $B\hat{A}C$ in the triangle ABC. DP and DQ are the two perpendiculars drawn from D to AB and AC.

i. Copy the given diagram into your answer script and mark all the data in it.

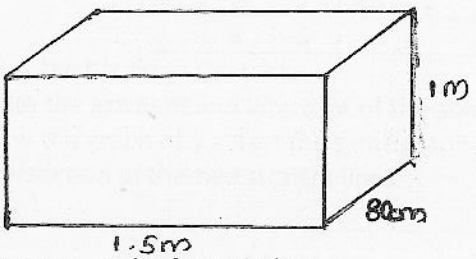
ii. Prove that $\triangle APD \equiv \triangle AQD$

iii. If BD = DC, Prove that $\triangle BDP \equiv \triangle CDQ$

iv. Prove that AB = AC



11.



A glass tank is shown in the figure below.

i. Find the capacity of the tank.

ii. Find the volume of water in the tank, if the height of the water in the tank is 0.9m.

iii. If 120 litres of water is removed from the tank, find the height of the water now in the tank.

12. $\xi = \{1,2,3,4,5,6,7,8,9,10\}$
$A = \{2,3,5,7,8\}$
$B = \{1,2,3,4,7\}$

i. Represent the above data in a Venn diagram.

ii. Write elements of the given sets.

a) B′ c) $(A \cap B)'$

b) $A \cap B$ d) $(A \cup B)'$