Item 1

Yours sister has a triangular board that she wants to use to cut out the circular tray on which the base of the cake will sit. The two sides of the triangular board measure 60cm and 48cm and the angle between is 60^o.

Your sister is not sure whether the largest circular tray (inscribed circle) she can cut out of the triangular board will be enough for the base of the cake.

Task

Determine whether the largest circular tray she plans to cut out of the triangular board will eb enough for the base of the cake.

Item 2

Your brother wants to design a children's playground. The play ground will have a triangular garden and a circular fence around the garden. The two sides of the triangular garden will measure $\boldsymbol{80m}$ and $\boldsymbol{75m}$ and the angle between them will be 75^o.

Your brother also wants to construct a circular fence around the garden such that the circular fence perfectly touches the three vertices of the triangular garden.

Your brother wants to put pavers in the region outside the triangular garden but inside the circular fence. Each square meter of pavers costs shs 25,000.

Your brother needs help in identifying the type of triangle represented by the triangular garden, coming up with an accurate design of the play ground as well as the cost of buying the pavers.

Task

(a) Construct an accurate design of the children's playground
(b) Identify the type of triangle represented by the triangular garden and give a reason for your answer.
(c) Determine the amount of money needed to buy the pavers.

Item 3

Tom marked an are within his compound using three stones A, B and C that he joined with a wire. He plans to create a largest circular flower garden that can fit within the enclosed area.

Stone B was planted at 040^o from stone A. stone B is also W50^oN from C. stone C was planted 7ft East of stone A.

Tom plans to plant grass in the parts of the demarcated area where the flower garden will not reach. He is not sure of the space area grass is to be planted yet he wants to base on it to estimate the seedlings of the grass he will need to cover it.

Task

(a) With aid of a scale drawing, illustrate for Tom how the entire garden is to appear.
(b) According to scale, drawing, what is the shape of the area demarcated with stones and wire? (Justify your answer)
(c) Determine the space area that Tom is to buy grass seedlings for.

Item 4

A stubborn bull is tethered on a rope in a triangular field of grass which is surrounded by maize, cassava and beans. Given that the field measures 11m by 9.5m by 8.2m.

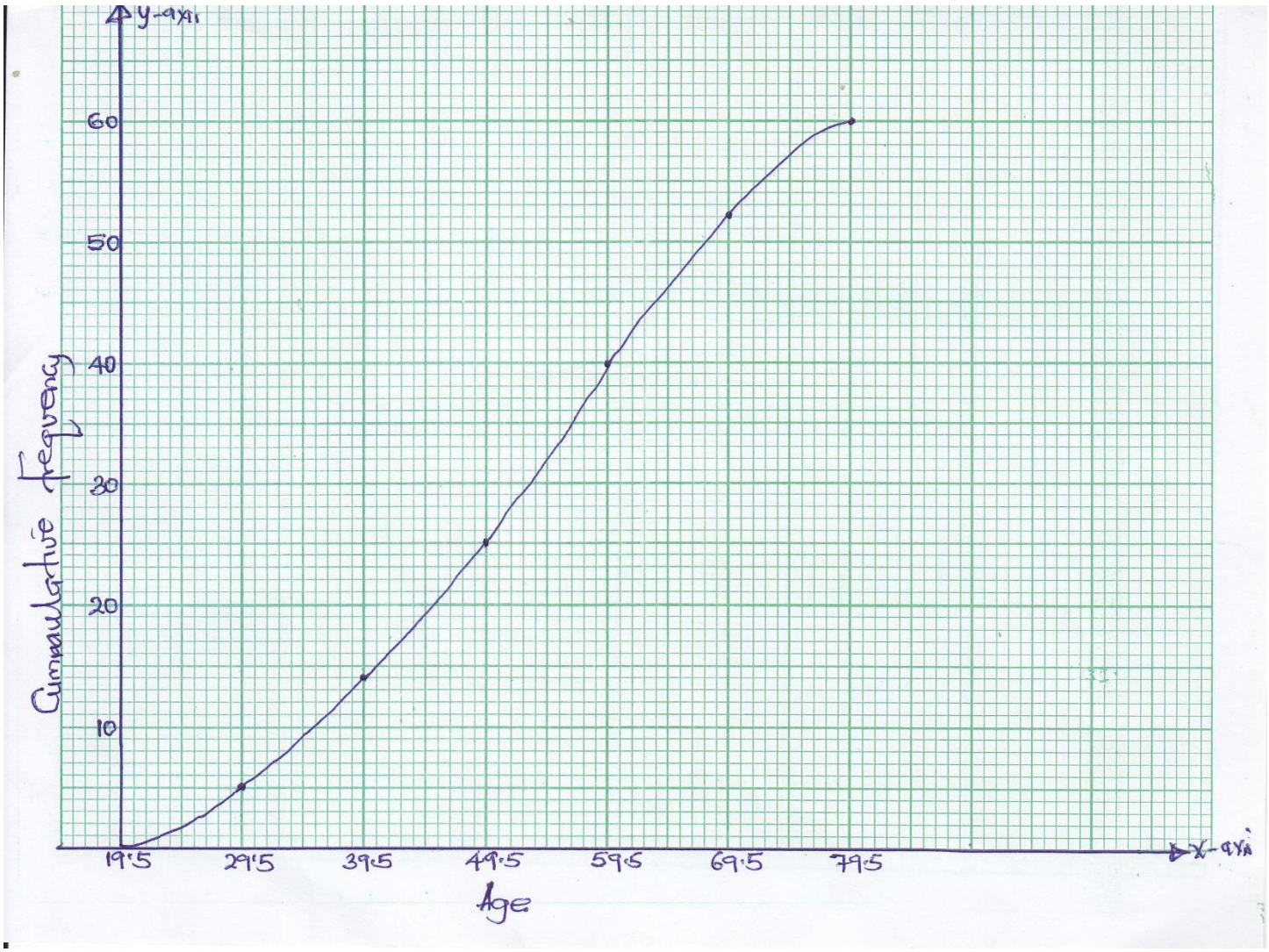
(a) Using 1cm to represent 1m, make an accurate drawing of the field.

(b) Determine the maximum length of the rope on which it can be tethered without eating the surrounding crops.

(c) Find the maximum area of the grass it can eat, hence the area of the grass not eaten by the stubborn bull.

Item 5

The diagram below shows the number of people by age who turned up for the National identity card registration at Lukuli Zone B.



Study the diagram and use it to;

(i) Find the median age of the people who registered

(ii) Prepare a frequency distribution table from the diagram above and state the modal frequency

(iii) Calculate the mean age.

COMPULSARY EXAMINATION PAPER

Item 1

The board of governors of a certain factory approved two billions one hundred fifty millions twenty thousand shillings as the annual budget for the company. Of this amount, 45% is to go to salaries, 0.125 is to run the factory's activities and the balance is to pay debts in which the amount is to be written on a bank cheque in words. The factory's accountant is your friend and since she is occupied with a lot of work, she seeks assistance to determine the amount to pay debts and how it will be written on the bank cheque.

The accountant also plans to meet two food suppliers of the factory and she is told that the first supplier comes at the factory offices after every 20 days while the second supplier comes after every 30 days. On 2nd/July, the two suppliers appeared together at the factory offices and the accountant will meet them the date they will come at the factory together again. She is wondering if she will be able to meet them before the end of the year.

Task

(a) Calculate the amount of money that the accountant is to pay for debts and hence, write it the way it will be written on the bank cheque.

(b) (i) Determine the date on which the two food suppliers will be at the company offices again.

(ii) Will the accountant be able to meet them before the end of the year? Give a reason for your answer.

Item 2

A certain hotel is organizing a workshop for its workers. The facilitator is paid a basic amount of Shs. 175,000 and then an additional Shs. 42,000 for every hour he facilitates. The hotel manager has a total of Shs. 553,000 for the facilitator and wants to find out the number of hours he will facilitate the workshop but he is finding it difficult to develop the relationship he can use

The facilitator will use a board and the manager has realized that the room that will be used has a board measuring $7ft$ by $4ft$ which is smaller. He wants to adjust this board to a size where its length will be $7ft$ longer than its width and its area to be $32ft^2$ more than the area of the board present. The manager needs your assistance to determine the dimensions of the new board so that he can tell the person responsible for the adjustments.

The manager also plans to buy 14 litres of milk and 7 loaves of bread for the workers' breakfast during the workshop. He has asked the caterer about the prices and tells him that he pays Shs. 56,000 for 10 litres of milk and 6 loaves of bread and he had also recently bought 7 litres of milk and 3 loaves of bread at a total cost of Shs. 32,000. The manager wants to know how much he should give the caterer for the quantities of milk and bread he plans to buy

Task

(a) (i) Determine the relationship between the total amount of money given to the facilitator and number of hours he facilitates

(ii) Use the relationship in a(i) above to calculate the hours that the facilitate will take for the amount that the manager has

(b) Calculate the dimensions of the new board that the manager wants to make

(c) Help the manager to find the total amount of money he should give to the caterer to prepare breakfast of workers during the workshop

Item 3/4

Kato is the head of district sports committee which is to conduct the district sports gala. In a certain activity, there are two teams that have the same points but only one team is to be selected to go to the next round. Kato decides that the team will be selected by using team captains. Each captain will randomly select two balls one at a time without replacement from a box which contains 12 black and 9 white identical balls. He decides that the captain who chooses balls of different colours, his team will be the selected team. Musa is a captain of one of the teams and believes that his team will be the one taken but he doesn't know the chances he has to achieve this

Kato is also meant to select a team that will represent the district at the national level. According to the rule, atleast 60% of the players taken should be playing football. Kato needs your help to know whether the district qualifies to take the team for nationals or more players are needed. From the team that has been selected; 9 play football and volleyball only, 15 play volleyball and netball, 17 play football and netball. 13 play netball only, 14 play football 0nly and those who play volleyball only are more than those who play all the three games by 2. The number of players who play football are 10 more than those who play volleyball. 45 players do not play volleyball

Task

(a) Determine the chances that Musa has for his team to be selected

(b) (i) Calculate the number of players who play football

(ii) Does the team qualify to be taken for nationals? Give a reason for your answer

Item 5/6

Your aunt is planning to go to the wedding of her friend. She wants to buy the gift that is similar to her neighbor's cylindrical bottle of height $14cm$ and diameter $5cm$. She decides that the bottle she will buy should have a capacity of at least $1620cm^3$. She wants to know the minimum height and radius of the bottle she is to buy so that she plans for the wrapping box she will use

To go to the wedding, she plans to drive her vehicle from home in the South East direction to town P which is $109km$ away from home. From P, she is then to drive on a bearing of 60^0 for $78km$ to reach town Q where the reception for the wedding will be. After the wedding, she is to return home using the direct route but she does not know how long the direct route is so that she plans for the quantity of fuel she will use.

Task

(a) Calculate the height and radius to nearest whole number of the bottle your aunt is to buy.

(b) Determine the distance of the direct route from Q to home.