HOLIDAY MATHEMATICS DISCUSSION ITEMS BY SENTAMU (0787-762458)

ITEM 1

Three women in your village **KIMANI, SAID** and **SANG** decided to start a poultry business. The initial capital they needed **UGX 3million** of which they were able to raise **40%,** by making contributions in the ratio **3:3:2** respectively. They approached a saving scheme who agreed to provide the remaining amount of capital, which was to be paid back within one year, with an interest of **20%** and in the same ratio. The women were to share the profits of the business in the ratio of the contribution. During the year, the business realized **UGX 3.2million.**

Task

(a) (i) Help the group of women to determine how much of the initial amount did **SANG** raise.

(ii) Help the women to determine how much did **KIMANI** pay to the saving scheme at the end of the year.

(b) Help the women to find out whether **SAID** was left with some money.

ITEM 2

Your aunt who works very far from home tells you to identify a shop that can give you beans , sugar and posho on credit and she pays for this consumable after every two weeks

She also tells you not to exceed shs.100,000 for the weeks on average. After touring the trading center you decide to pick the consumables from a shop that sells a kilogram of beans at shs,4,000, a kg of sugar at shs.5,500 and a kg of posho at sh.2,400. You plan to always pick consumables on every Monday and Thursday while taking records as follows.

Week one

Monday : 2 kg of beans , 3kg of posho and 2 kg of sugar

Thursday : 3 kg of beans and 4 kg of posho

Week two

Monday : 2 kg of beans , 4 kg of posho and 3 kg of sugar

Thursday : one kg of sugar, 2 kg of beans and 5 kg of posho

Task

(a) How many kg of each consumables did you pick from the shop for the two weeks?

(b) How much money will you tell your aunt to pay ?

(c) Did you fit in the planned expenditure budget proposal by your aunt?

Item Three

In the bid to determine the likelihood of a particular cello[hone being successful on the market, your uncle who owns an electronic shop tasked you to conduct a survey on 150 on the streets of your town about the usage of these cello phones. Galaxy(G) , flip phone (F) and I – phone (I), then he will decide whether to purchase more of a given type if the likelihood of those who used only one type of phone is more than 0.5.

45 people owned a flip phone , 60 owned an I- phone, 63 owned a galaxy, 15 0wned a flip phone and an I-phone, 25 owned both a galaxy and an i-phone , 15 have owned both a galaxy and a flip phone only and 5 have owned all the three

Task

Advice your uncle on whether to purchase of these types.

ITEM 3

Daniel discovered that the number of customers buying from his shop doubles every week. In order to promote his sales, he decides to give a free soda to whoever buys from his shop during the 6^{th}, 8^{th}, and 12^{th} week. He wants to purchase the sodas early enough but does not know how many of them he should purchase for the promotion.

Task

(a) If there were 4 customers in the first week, help Daniel to find how many sodas he needs to purchase.

(b) Due the large number of bottles of sodas needed. Daniel wishes to purchase in crates. Help Daniel to know the number of crates he needs to purchase for the promotion.

(c) Given that a crate of soda is sold at UGX 18000 and a bottle of soda is sold at UGX 1000.

  (i) How much money would Daniel spend on buying crates of soda in (b) above?

  (ii) How much would Daniel spend by buying soda in bottles in (a) above?

  (iii) How much would Daniel save in crates?

(d) Express the amount of money Daniel saves by buying the soda in crates as a percentage of buying soda in bottles.

ITEM 4

Two friends, Sarah and Moses, started a poultry project to which they contributed money in ratio 4:6 respectively. They agreed to share the profits in the ratio of their contributions and the project started with 2,000 birds.

After selling all the birds, they made a profit of one million five hundred thousand shillings. They re-invested the profit in the project and the number of birds increased to 2,500. However, Moses and Sarah were not sure of the amount they re-invested as well as the percentage increase in the number of birds.

Task:

(a) How much of the profit did Moses and Sarah re-invest in the business?

(b) What was the percentage increase in the number of birds?

ITEM 5

A man intends to plant trees on the two sides of the road which leads to his land. On one side of the road, he is to plant a tree every after 5m yet on the other side he is to plant a tree every after 6m. At the start of the road, two trees are to be planted directly opposite to each other.

In the first phase of planting trees, he will plant trees until another pair of trees is again directly opposite. His land has an area of $500m^2$. He plans to use 25% of the land to plant maize, one fifth of the land for beans and $205m^2$ for growing G.nuts.

Task:

(a) Help the man determine how many tree seedlings he needs to buy to just plant in this first phase.

(b) Determine in m^2 the size of the land to be used for growing maize

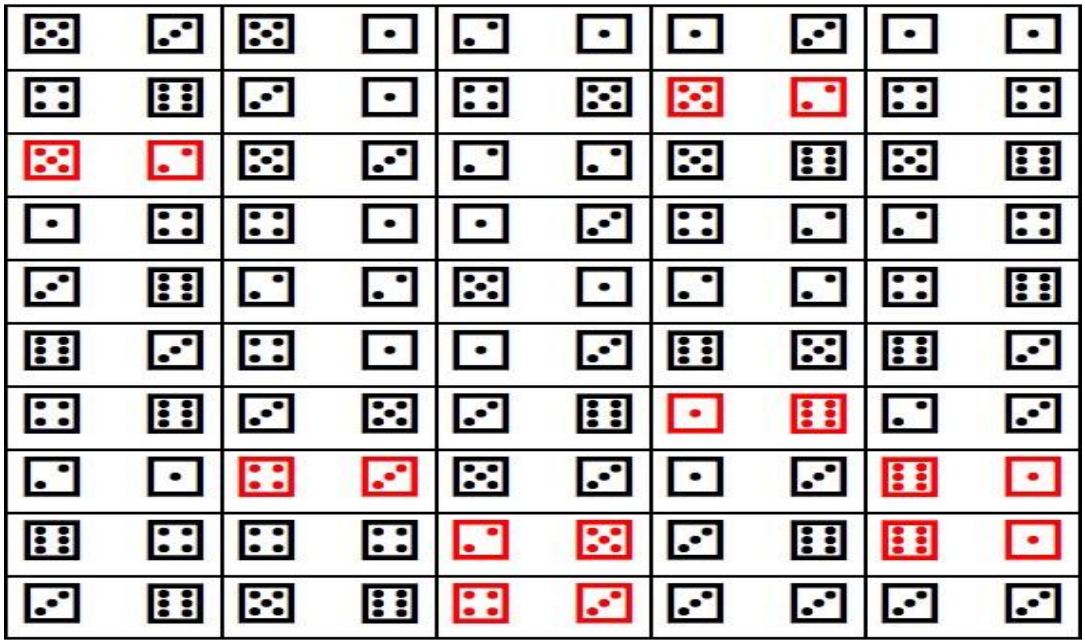
(c) Determine in m^2 the size of the land to be used for growing beans

(d) Express the area to be used for growing G.nuts in standard form

(e) Do you think he partitioned the entire land properly? Give a reason

ITEM 6

A friend of yours wanted to participate in the National Ludo Championship competitions. During his practice, he rolled a die several times and kept on taking a picture of each occurrence. He needs to find out whether he will compete favorably but he is unable to do so. He gives you the diagram bellow showing his scores so that you can guide him.



Tasks

(a) Use the information above and clearly show how to determine the score with the highest chance of occurring on top. Which score is it?

(b) Find the probability that an odd number occurred when the die was rolled

(c) Present the information of the above scores on a graph.

(d) Will your friend compete favorably in the competitions? Give a reason.

ITEM 7

Two friends, Namazzi and Katayike went to Alpha Electronics shop to buy a refrigerator. The refrigerator type they wanted was valued at $\mathbf{UGX\ 900,000}$. Namazzi paid cash for her refrigerator while Katayike opted to pay on hire purchase which was $\mathbf{15}\%$ more than the cash price. If Katayie paid an initial deposit of $\mathbf{UGX\ 124,200}$ and was expected to pay the remaining amount in $\mathbf{9}$ monthly equal installments of $\mathbf{UGX\ 105,500}$. When Namazzi used her refrigerator for **two** years, she opted to sell it to Lwere and I had been valued to have depreciated annually at a rate of $\mathbf{8}\%$ per annum.

Task

(a) How much did Katayike pay per month?

(b) How much more did Katayike pay than Namazzi.

(c) How much did Lwere pay to Namazzi for the refrigerator.

ITEM 8

In a school of 100 teachers, 16 like Football (F) and Netball (N); 6 like Volleyball (V) and Netball (N); 8 like Football (F) and Volleyball (V). 26 like more than one game. 30 like Football. 40 like Netball. 14 like only volley ball.

Task

(a) Find the number of teachers' who like

(i). all the three games

(ii). none of the games

(iii). volley ball.

(b). What is the probability that a teacher chosen at random likes;

(i). atleast one game

(ii). atmost one game

ITEM 9

Simon is the district inspector of schools in Butambala district found that his causal workers use one third of his farm for bananas, one quarter for coffee and two fifth of the remainder for mixed farming. She still has some six acres of unused land.

Buddo S.S has a student population of 1200 students. On a particular day Simon invited the entire for a fifth of the boys and ¼ of the girls went to **WAKISSHA** resource centre for a sports meeting. If 936 students were left behind.

The price of Simon's house was valued at 45 million shillings. It increased by 25% after the first year but in the second year, the value of the house depreciated by 10%.

Task:

(a) Find the size of his farm and clearly illustrate it on a diagram.

(b) Find how many more boys than girls attended the meeting.

(c) Find the value of her house at the end of the second (2^{nd}) year.

ITEM 10

Tom bought 2 eggs and 3 tomatoes at a total cost of Shs 3700. The cost of 4 tomatoes is Shs 900 more than that of one egg. Joan wants to buy five eggs and two tomoatoes.

A man borrowed Shs 200,000 from the bank at a simple interest rate of 2.5% per annum. He paid back the money in 24 Equal monthly installments over a period of two years. However he wants to know how much he wants to know how much he will pay per instalment.

Your school head teacher has received a total of 1200 exercise books is to be shared by four classes, 4A, 4B, 4C and 4D. Senior 4A is given $\frac{1}{3}$ of books, of the remainder $\frac{2}{5}$ is to go to 4B.The other two classes share the remainder with 4C getting 60 more books than 4D.

Task

(a) Help Joan know how much he will spend.

(b) How much money did he pay every month?

(c) Distribute the books amongst the four streams.

ITEM 11

In a certain school there are 87 students in S.3. Of these 43 play hockey, 42 play football and 47 play volleyball, 15 play hockey and volleyball, 17 play volleyball and football and 21 play hockey and football. Each student plays at least one of the three games. The head teacher wants to introduce board games if the chance that a student is selected at random in the class and plays more than one game is above 0.5.

Task

Advise the head teacher if he should introduce board games.

ITEM 12

Prosy is supposed to pay UGX 4,500,000 per year at the University. This amount is divided in the ratio 4:3:3 for her fees, accommodation and meals respectively. She is supposed to pay 60% of the fees in the first installment, pay a third of the remainder of the fees in the second installment and the rest of the fees in the third installment.

Prosy is supposed to get the money for her fees from a mobile money agent using a 4-digit code. For safety reasons, her father gave her the code written as 234 in base ten and Prosy has convert this code to base six to get the actual code.

Task:

(a) How much will Prosy pay for fees in the last installment?

(b) How much money will Prosy pay for accommodation?

(c) Help Prosy to determine the actual code for withdrawing the money from the mobile money agent.

ITEM 13

The S.4 candidates of your neighboring school have organized a thanksgiving party to thank God for making it to this time of their studies. The class has four streams A, B, C and D and they plan to buy their head teacher a gift. So they mobilized themselves as follows;

Stream A contributed one hundred thirty-three thousand two hundred fifty shillings. Stream B contributed one and half times the amount of Stream A. Stream C contributed 20% more than that of Stream A while Stream D contributed a fraction which is a fifth less that of B of the amount of A contributed. The class teacher contributed the balance required to make UGX 800,000 which was the cost of the gift.

On the day of Prom, the money was given to the class teacher to pick the gift from the nearby shop. From school, she used a boda-boda moving at $60kmh^{-1}$, they moved for 30 minutes due east and then 40 minutes due

north to reach the shop. She wants to return to school as quickly as possible.

Tasks:

(a) Help design a budget contribution for the four streams of your class.

(b) Arrange the contributions in ascending order, and advise how the contributions would be made fair.

(c) How long will it take the teacher to return to school.

ITEM 14

Your uncle has 720 animals on his farm. Since you are in holiday he has asked you to take care of it and sell all the chicken on the farm. However he doesn't know how many chicken are on the farm. He gives you the following information to guide. 30% of the animals are goats while a sixth of the remainder are sheep. The rest of the animals are chicken and cows divided in the ratio of $\mathbf{7:5}$. He plans to sell all the chicken during this festive season at a cost of $\boldsymbol{UGX25,000}$ per bird.

Task:

Help your uncle find how

(a) many animals of each kind are on the farm

(b) much he will get from the sales of the chicken,

ITEM 15

A butcher sold you five kilograms of meat at seventy thousand Uganda shillings on 20th December. However on the price of each kilogram of meat was increased by $\mathbf{25}\%$ in the festive season. Your cousin as been sent to the same butcher on 24th December with the same amount of money and finds

out the new price of each kilogram of meat. He doesn't know how many kilograms of meat he is able to buy.

He called your parents to ask for additional money to top up the kilograms but he doesn't know the Airtel Money pin number. Your parent is in church and sends a message saying that the pin is 210 in base ten. But he has to convert it to base five to obtain the original pin.

Every festive season your family gives a package to the less privileged community in the slums. This year they have assembled 250 packets of fortune cooking oil, 300 bags of rice of 10kg each, 200 packets of Azam wheat flour. The family wants each package to have equal number of each items.

Task

(a) Help your cousin find out how many kilograms he is able to buy with this amount of money.

(b) Help to encrypt the pin in order to buy the remaining meat.

(c) (i) Assist your family members to fins how many people they will be able to give the items this year.

(ii) Using your mathematics knowledge, assist the family to know much quantities of each item will be put in each package.

ITEM 16

A certain Security personnel from Super Security company is planning to buy a 32 inch Hisence TV before the year ends. However the Indian shop selling the TV has two options. Ether he pays cash of UGX 520,000 with a 10% cash discount or pay a deposit of UGX280,000 followed by six monthly instalments of UGX 54, 500. He wants to know which payment term is cheaper.

The table below shows the tax structure on taxable income of citizens in the working class of a certain country.

Income (sh) per annum	Tax rate (%)
(i) 1st sh 80,000	7.5
(ii) Next sh 80,000 (160,001-240,000	12.5
(iii) Next sh 80,000(160,001-240,000	20.0
(iv) 240,001- 320,000	30.0
(v) 320,001- 400,000	36.5
(vi) 400,001- 480,000	45.0
(vii) 480,001- and above	52.6

The officer's gross annual income is sh 964,000. The allowances including insurance accrued to him were;

(i) Housing sh 14,500 per month.

(ii) Marriage: one tenth of his gross annual income

(iii) Medical sh 50,700 p.a.

(iv) Transport sh 10,000 per month

(v) He has to pay an insurance premium of sh 68,900 per annum.

(vi) Family allowances for only four children at the following rates sh 3,400 for each child above the age of 18, 4,200 for each child above 10 but below 18 years and sh 5,400 for each child below 9 years. Given that he has a family of five children with three of them below the age of 8, one 16 and the elder child 20 years. He is finding it hard to calculate his net income.

Task

(a) Help the officer know which payment term is cheaper; justify your answer.

(b) Assist the officer determine his net income.

ITEM 17

A butcher sold you five kilograms of meat at seventy thousand Uganda shillings on 20th December. However on the price of each kilogram of meat was increased by **25%** in the festive season. Your cousin as been sent to the same butcher on 24th December with the same amount of money and finds out the new price of each kilogram of meat. He doesn't know how many kilograms of meat he is able to buy.

He called your parents to ask for additional money to top up the kilograms but he doesn't know the Airtel Money pin number. Your parent is in church and sends a message saying that the pin is 210 in base ten. But he has to convert it to base five to obtain the original pin.

Every festive season your family gives a package to the less privileged community in the slums. This year they have assembled 250 packets of fortune cooking oil, 300 bags of rice of 10kg each, 200 packets of Azam wheat flour. The family wants each package to have equal number of each items.

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(b) Help to encrypt the pin in order to buy the remaining meat.

(c) (i) Assist your family members to fins how many people they will be able to give the items this year.

(ii) Using your mathematics knowledge, assist the family to know much quantities of each item will be put in each package.

ITEM 18

Kasawuli a farmer in Bulamogi Sub County wishes to sale his goats: to get to his farm, the buyer walked 15km west from his home to kaliro town, then 8km South to Kasawuli home, however Kasawuli realized there was a direct route from the buyer's home to his home that he could have used.

After the sales, Kasawuli wishes to start a hardware in the town that is valued at twelve million five hundred thousand shillings only. He received **45%** of the required amount from the sale of his goats and wants to top up the balance. He approached two money lenders Juma and Saidi who lend money according to the following conditions.

JUMA	**SAIDI**
He lends at a simple interest rate of **8%** per annum payable in **24** monthly installments.	He lends at a compound interest rate of **6%** per annum payable in **24** monthly installments.

Mr kasawuli wants to decide on which of the two money lenders to opt for.

Task:

(a) Help Mr. Kasawuli find the length of the direct route for the buyers to use.

(b) Help Mr. Kasawuli find how much money he intends to borrow.

(c) Which of the two money lenders would you recommend Mr. Kasawuli to opt for.

(d) Having selected for Mr. Kasawuli the right money lender, how much does he pay per installment.

ITEM 19

Your mathematics teacher is planning to get group leaders from your stream. He has selected thirty students from your class from whom he plans to pick the leader. Their scores out of 80 are given below.

43 70 50 35 64 62 50 53 46 62 65 83 59 54 58 64 52 54 32 59

48 54 35 48 40 58 64 40 71 74 55 70 72 48 75 45 55 40 57 55

Task:

With reasons, basing on calculations, suggest the suitable score the teacher should use to select the leaders.

ITEM 20

The new head teacher of a certain school on his survey found out that a third of his land has a cattle farm, ¼ has been covered by a coffee plantation and $\frac{2}{5}$ of this land for mixed farming and he still has excess land of six acres. However he doesn't know how many acres of land the school has especially mixed farming.

He wants to buy a house, whose value was fourty million in 2022. After one year, the value of this house increased by 15% of its original value and also reduced by 10% this year because the government project to construct a tarmac road was extended until 2028. He has 40.5millions for the house.

On a particular day, he his two askaris tour the land after different time intervals. The Junior askari tours after 1 hour and 20 minutes while the Senior Askari tours after very hour. He always receives a report from them when

both are touring all together at the same time. He last met them at 1145hours.

The school **WIFI** pass word was changed from 145_{six} to another pass word by adding 314_{five} to the previous password in fear of hacking it by the ICT students of your class.

Task:

(a) Help the new head teacher determine the school 's farm land allocated to mixed farming.

(b) Determine whether the money he has is enough, justify your answer.

(c) Help him determine when he will receive the second report.

(d) Obtain the new school **WIFI** pass word.