

DISCUSSION ITEMS

Item One

At a secondary school in Uganda, the Senior Four class, made up of 125 students, was organising their end of level prom party. Each ordinary student contributed UGX 100,000 to support the event, while each prom committee member contributed twice as much. The committee consisted of 8% of the student body. The money collected was to be spent on three major items: music, decorations, and food, in such a way that the amount spent on decorations was twice the amount spent on music, and the amount spent on food was three times the amount spent on music.

On the morning of the party, the decorator arrived at 9:00 AM with a team of three workers. He estimated that the full decoration setup would take six hours to complete. However, the prom committee requested that the decorations be finished by 1:00 PM, so that the venue would be ready well in advance of the event's official start at 2:00 PM. In response, the decorator had to figure out whether he needed to add more workers to meet the new deadline.

Meanwhile, entertainment was scheduled and the DJ had his set list prepared. According to his schedule, Amapiano tracks would be played every 30 minutes, and Afrobeat songs every 1 hour and 10 minutes. The DJ had last played both genres together at exactly 8:45 PM, and since the school's policy required the event to end by 10:00 PM sharp, he wanted to find out whether the two would overlap again before closing time.

Task:

- a) Help the students calculate how the total money collected was distributed among the major items based on the given ratio.
- b) Determine whether the decorator will complete the work by 1:00 PM with his current team, and if not, how many additional workers must be added.
- c) Will the DJ play Amapiano and Afrobeat at the same time again before the party ends? Support your answer using mathematical reasoning.

Item two

A wholesaler wishes to transport at least 240 bags of sugar from the factory to his shop. He has a lorry that can carry 90 bags per trip and a pick up that can carry 20 bags per trip. The cost of each trip is UGX50,000 for the lorry and UGX 15,000 for a pick up. He has UGX 180,000 available to transport the sugar. The pick up makes more trips than the lorry.

Task:

- a) Write mathematical statements that show the relation between the lorry and the pick up.
- b) Show the feasible region of the relation on the Cartesian plane.
- c) Use the graph to find the possible number of trips to be made by the lorry and the pick up .Hence find the minimum cost of transporting the bags of sugar

Item three

Your friend owns a rectangular piece of land of which he wants to construct a house with a rectangular cross section leaving a path 2m around the house base. The path occupies an area of 76 m^2 and he also wants the dimensions of his house floor to differ by 3m.

He also owns a soft drink depot where he sells Crates of soda and boxes of juice. Tom bought 4 crates of soda and three boxes of juice and paid Shs 110,700. Tom's brother bought 3 crates of soda and 4 boxes of juice and paid Shs 122,400 but he is not contented about the money he paid claiming that he bought almost similar items as Tom but he has paid much money.

Task:

- a) (i) Determine the size of the floor base of your friend's house.
(ii) How big is your friend's piece of land?
- b) (i) Help Tom's brother to be contented with the payment he made.
(ii) How much would Ann pay if she buys 2 crates of soda and 2 boxes of water from the same depot?

Item four

In preparation for the upcoming national voter registration drive in Uganda, the Electoral Commission needs to determine the optimal opening time for registration centers across various districts. This decision aims to facilitate maximum voter registration and ensure efficient processing of the data of the citizens eager to participate in the upcoming elections. Here are the arrival times of citizens at a sample voter registration center in minutes past the scheduled opening time (8:00 AM):

11	66	21	88	33	67	41	45	47	41
27	62	32	43	31	34	66	20	21	36
26	75	80	45	12	44	58	48	42	38
56	63	68	24	21	65	68	63	72	38

Task:

- (a) Based on calculations using the collected data, suggest an opening time for voter registration centers.
- (b) Following advice to open registration centers when at least 50% of expected citizens have arrived, determine the opening time.
- (c) As the Electoral Commission of Uganda, which of the two suggested opening times from (a) and (b) would you choose, and why?

Item five

In a school survey, 260 students were asked about their internet usage habits. They were asked to choose from three activities: Social Media (like Facebook and TikTok), Academic Work (such as research and homework), and Playing Games. The results showed that 165 students use the internet for Social Media, 130 use it for Academic Work, and 100 use it for Playing Games. Among them, 70 students use it for both Social Media and Academic Work only, 60 use it for both Social Media and Playing Games, and 50 use it for both Playing Games and Academic Work. Additionally, no students exclusively use the internet for playing games. Now, the school needs to decide whether to set rules if more than 60% of students spend their internet time on Social Media.

Task:

- (a) Calculate how many students use the internet for at least one of these activities.
- (b) Determine how many students don't use the internet at all.
- (c) Estimate the percentage of students who use the internet solely for Academic Work.
- (d) Based on the findings, advise the school on whether to implement rules or not.

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