SENIOR ONE: END OF TERM ONE HOLIDAY PACKAGE

MENGO SENIOR SCHOOL

1. Anna has thirty two millions, two hundred sixty thousand shillings. She intends to buy a piece of land with three quarter of the money and three-fifth of the remainder to buy herself a pair of shoes. She intends also to buy her little brother a ball as a present for his birthday. The ball costs 150,000 shillings. Anna is to save the rest of the money for her Christmas present. However, Anna is confused on how much money will be left as balance for her savings.

   Task: Help Anna to allocate her money and to know how much money she will save for her Christmas present.

2. In Emo sugar factory, two machines are programmed to operate at regular intervals. Machine A seals ten bags of sugar after every 12 minutes while machine B seals fifteen bags of sugar after every 18 minutes. Both machines start working at 8:30 AM, at what time will both machines finish their tasks simultaneously? How many bags of sugar will both machines have sealed at that time?

3. Mengo S.S is hosting a sports tournament, football, netball and basketball games are scheduled to occur at regular intervals. All the three games are to start at 9:00AM, football games are played for 45 minutes, netball is played for 15 minutes and basketball games are played for 25 minutes. The tournament coordinator suggested that learners break off for lunch at the time when all the three games will be played together for the second time. However, most of the S.1 learners are not certain about the time referred to by the coordinator.

   Task: Help the S.1 learners to tell the time at which their lunch will be served.

4. A baker has two types of cookies, 36 chocolate and 60 vanilla. He wants to pack

them into boxes with no cookies left over. He wants to know the maximum capacity of the box he can use to pack the cookies separately but in equal quantities (numbers per box). He also intends to sell each box of chocolate cookies at 3,500 shillings and a box of vanilla cookies at 4,500 shillings.

Task: Help the baker to know the capacity of the box he must use and the total amount he will receive after selling all the boxes of cookies.

5. Mr. Lule is a farmer in Gombe village, he has three lengths of fencing wire. One wire is 150 meters, the other is 180 meters and another is 210 meters. He wants to cut all the three wires into equal-length pieces without any waste. He intends to sell each cut piece of wire at eight thousand fifty shillings and use two-fifth of the money to buy fertilizers for his garden and half of the remaining amount to buy a gift for his grandson.

   Task: Help Mr. Lule to determine the longest possible length for each piece, and how much money he will spend on fertilizers and a gift for his grandson.

6. Jane has a rectangular flower garden with dimensions of 250m by 750m. she wants to plant pine trees at regular intervals along the perimeter of her garden. However, Jane is a very financially disciplined lady who hates buying beyond what she needs, she wants to be sure of the maximum space between the pine trees and the exact number of pine trees she needs to buy to surround the entire flower garden provided that the pine trees are maximumly spaced. Help Jane to accomplish this task.

7. You are organizing chairs for an event with 456 guests. You want to arrange them in rows of 3, 4 or 5. Determine which of these groupings will allow full rows with no leftover chairs and hence the number of rows formed.

8. A company prints invoices with 4-digit numbers which are validated following a two-step procedure.

   Step one: “An invoice number is valid if its last three digits are divisible by seven”

   Step two: “An invoice number is valid if it is divisible by eleven”

   Four customers presented the following invoice numbers for validation: **1749**, **5673**, **2277** and **1056**

   Find out which invoice numbers are valid following the company verification system.

9. In a secret message to his mother, Allan wrote the first three digits to his 5-digits pin code in a base less than eight as: **26t**. The value **t** could be found by solving the expression: $\mathbf{26t_x + 101_{two} = 148}$, where x is a base less than eight. Given that the last two digits of the pin code are **“78”** write the first three digits and hence write the pin code.

10. Aisha has 16 baskets of five oranges. Her mother added her four oranges. She is to share these among her seven friends in boxes that carry either 4 oranges or 11 oranges, without leaving any remainders. Aisha is confused on whether to pack the oranges in boxes of 4 or 11 oranges. She also intends to know what fraction of oranges each of her friends received.

    Task: Help Aisha to:

    a. Choose the box to use for packaging the oranges, with evidence.

    b. Determine how many boxes were received by each of her friends.

    c. Know the fraction of oranges received by each of her friends.

11. The members of a village SACCO are in a dilemma. They need to withdraw money from their SACCO account for an important function. The SACCO chairman, trying to protect the four-digit PIN of the ATM card, converted each digit from base 10 into another base lower than base 5. The converted PIN is recorded as: 13, 20, 21, 12. Unfortunately, the chairman cannot remember the exact base he used for the conversion, leaving the SACCO members unable to withdraw the funds.

    Task: With a reason, help the SACCO members identify the base and the original pin so that they can withdraw the money.

12. A Senior One classroom has been without tiles for the last two years, causing students to struggle with dust in the class. The school engineer is now tasked with tiling the classroom floor, which measures $540\ cm$ by $420\ cm$, using square tiles of length $x\ cm$. The challenge is to find the length of largest size of square tiles that can fit the classroom floor without needing to cut any tiles. Additionally, the engineer needs help determining the number of tiles required and the total cost for purchasing the tiles. It is known that each tile of size $x\ cm$ costs shillings five thousand two hundred fifty.

    Task: Help the school engineer by calculating the largest size (x cm) of the square tiles that can be used, the number of tiles needed to cover the entire floor, and the total cost to purchase the tiles

13. The school organized an interclass competition for non-candidate classes: S1, S2, S3, and S5. The prize money of shs. 4,000,000 is to be shared based on the classes' performance in four games. The scores for each class in the games are as follows:

Class	Football	Netball	Volleyball	Chess
S.1	15	15	25	20
S.2	10	25	15	10
S.3	10	10	10	15

S.5	5	25	20	10

Award basing on position:

Position	Percentage share (%)
1	40
2	30
3	20
4	Remaining percentage

Task: Help games master identify the winner and how much each class will receive as prize money.

14. The school administrators have asked an engineer to design a shape on the ceiling of the community school. They provided the engineer with a set of coordinates describing the shape as (0,6), (−2,3), (2,3), (5,3), (−5,3), (−2,0), (2,0), (−5, −4), (5, −4), $a \quad n \quad d$ (0, −2). The points are scattered across the rectangular Cartesian coordinate system, and the engineer must plot these points accurately to visualize and design the shape on a cartesian plane. He wants you to help him with the task and tell him the shapes that's needed.

    Task: Help the engineer by plotting the coordinates on the Cartesian plane and determining the overall shape