

S.3 Mathematics

Item 1

To safe guard his safe, John wrote his three-word security code as 1420 in base six. He also started to keep half of his monthly income at the bank, half of the remainder in the safe and the remaining as cash for daily expenses.

In march John kept Ugx. 400 000 as cash for daily expenses.

Task:

- a) What is John's security code in base ten?
- b) What fraction represents the money spent as cash?
- c) Determine John's march salary.

Item 2

A straight high way is being proposed connecting cities A and B that are at positions (4,2) and (2,14) respectively on the map.

A major market is also being proposed to be built at the position midway between the cities A and B.

When asked about the funding, the board members said the government is to give 1 million dollars in the first month and half a million dollars every other month until the end of the proposed time for this project.

Task:

- a) Determine the representative equation of the road.
- b) How far is city A from B and locate the position of the market on the map.
- c) If the proposed time of the road project is 6 months, how much will the project construction cost.

SECTION B

Item 3

A pilot helicopter flies from Gulu on a bearing of 140° towards Tororo, which is 330km away. It then flies to Luweero, which is on a bearing of 175° from Gulu. The distance between Tororo and Luwero is 198km.

A man in the car on the ground realizes that the angle of elevation of the helicopter to him is 45° . He drove 20m towards (forward) the helicopter and realizes that the angle of elevation is now 60° .

Task:

- a) Assume you're the Co-pilot help him design route direction system to help him know.
 - i) The distance between Gulu and Luwero.
 - ii) The bearing of Tororo from Luwero.
- b) Determine, how far the man from the start to base of the helicopter. (assume helicopter was stationary when the car was moving)

Item 4

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 50m and 70m, and the angle between them will be 45° .

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 intends to put pavers in the region outside the triangular garden but inside the circular fence. Each square metre of pavers costs shs.35,000.

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

Task:

Help your brother to;

- 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.

END