MATHEMATICS

Instructions:
- ✓ Attempt all questions in Section A and any two from Section B
- ✓ Clean and Tidy Work is a Must
- Extra Questions answered will not be marked
- Silent Non-programmable calculators and log books may be used.
- ✓ Each question in Section A carries 5 marks and each question in Section B carries 15 marks.

Section A

1. (a) Use brackets to qualify these statements

(i) $8\times5+3-3=61$

(ii) $5-3\times4+7=22$

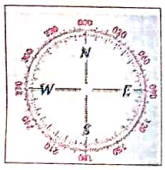
(b) The display on the outer door of a factory's cold room is show below

Temperature (Outer Room): 2 °C	Temperature (Freezer): -12 °C

(i) How much warmer is the outer room than the freezer?
(ii) Apples are to be stored in the outer room but will be damaged at temperature below 8 °C. By how much should the temperature be raised to store the apples safely?
(iii) If the temperature of the freezer is to be lowered by 7.5 °C so that the freeze can store fish. What will be the new reading on the display?

2. Rugira bought 3½ kg of beans and packed it in small packets of 1/12 kg each.
(a) How many packets did he create?
(b) If he sold each packet at UGX 600,
(i) How much money did he get?
(ii) At this rate, what is the price of a kg of beans?

3. Bukomansimbi is on a bearing of 2000 from Gulu. Arua is on a bearing of 0700 from Gulu. Arua and Bukomansimbi are 200 km and 420 km respectively from Gulu. What is the;
(a) Gulu from Bukomansimbi?
(b) Bearing of Arua from Bukomansimbi?



4. Two strings were tied together at one common point. Different angles are created and measured as shown below. Find the missing angles.

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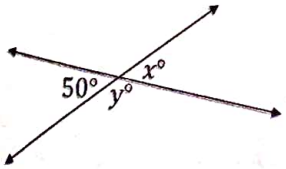

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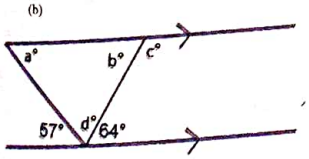
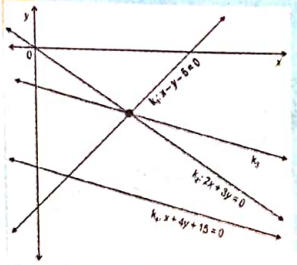
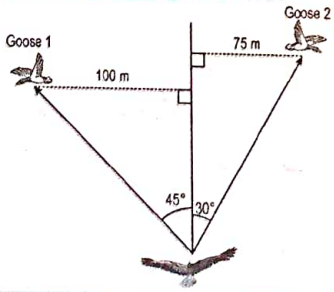


5. The following illustration shows four straight lines. It is true that K_1, K_2 and K_3 intersect at the same point. K_3 and K_4 are parallel to each other. Determine the equation of K_3.



6. The position of an eagle and two identical geese are shown in the following figure. All the birds are at the same height from the ground. Assume that the eagle can fly at the same speed in all directions and that the geese are unaware of the eagle's intentions and so will not move from their current positions, If the eagle wants to attack the geese that is nearer to it, which one should it attack? Show your working clearly.

(Use $\sqrt{2}=1.41$ and $\sqrt{3}=1.73$).



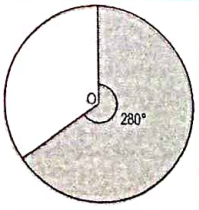
7. The following illustration shows a circle with centre **O**. The shaded sector has an angle of 280° and area **A cm²**. Which of these is the area of the unshaded sector.

(a) $\frac{2}{7}Acm^2$

(b) $\frac{2}{3}Acm^2$

(c) $\frac{1}{3}Acm^2$

(d) $\frac{7}{9}Acm^2$



Show all the working clearly

8. Tugume melted 11 ice cubes each with a side length of k cm into a cylindrical cup of radius r cm. Which of the following represents the height of the melted ice in the cup? Take $(\pi=\frac{22}{7})$

(a) $\frac{7k^3}{4r}cm$

(b) $\frac{7k^3}{2r^2}cm$

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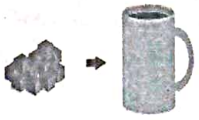

9. The frequency distribution below of daily rainfall received in a town during a certain period is shown below. Unfortunately, due to manual errors, the information on the 20-40 mm range got deleted from the data. If the mean daily rainfall for the period was 35 mm, find the number of days when the rainfall ranged between 20-40 mm. Show your working clearly.

Rainfall (in mm)	Number of days
0 - 20	7
20 - 40	x
40 - 60	10
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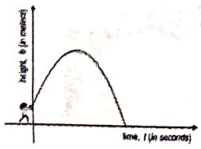
10. The following graph represents the path followed by the ball thrown by Apio. The maximum height h the ball reaches with respect to time t is represented by $h(t)=-t^2+\frac{19}{4}t+\frac{5}{4}$.



How long will it take for the ball to reach the ground. Show your steps clearly.

SECTION B

(Each question attempted is 15 marks)

11. (a) A food store has enough food to feed 200 students in 15 days. How long will the food last if 50 more students join the group?

(b). Mukasa found out that the total cost of operating his juice machine was divided into fixed cost (Z) and variable cost (K). The fixed cost is the cost the he incurs even at zero level of production and the variable cost is directly proportional to the amount of juice sold. He launched some new flavour of juice and wanted to find the fixed cost associated with it. He found out that his total cost was UGX 27,500 after selling 150 units and UGX 32,500 after selling 250 units.
(i) Form an equation relating the total cost, fixed cost and the variable cost.
(ii) Determine the fixed cost he incurred on launching the new flavour of juice.
(iii) What is the variable cost per unit of juice sold?

12. Given the equation below. The steps shown on the right were followed by Opio to solve the equation. He however made a mistake in one of his steps. Identify the erroneous step and help him to complete the solution.

$$\frac{3(x+y)+7(x-y)}{(x^2-y^2)}=12$$

Step 1: $\frac{3(x+y)+7(x-y)}{(x+y)(x-y)}=12$

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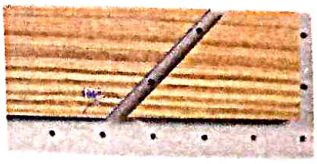

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SOLUTIONS NEXT MONDAY

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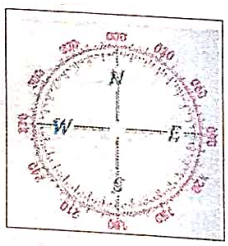

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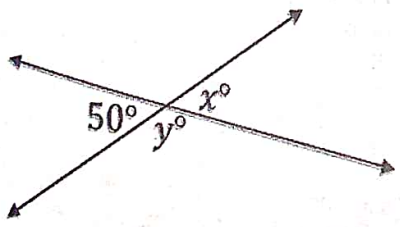

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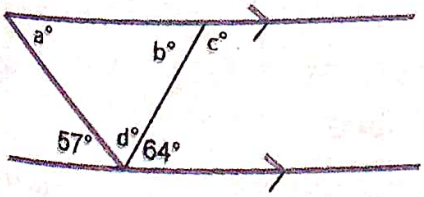

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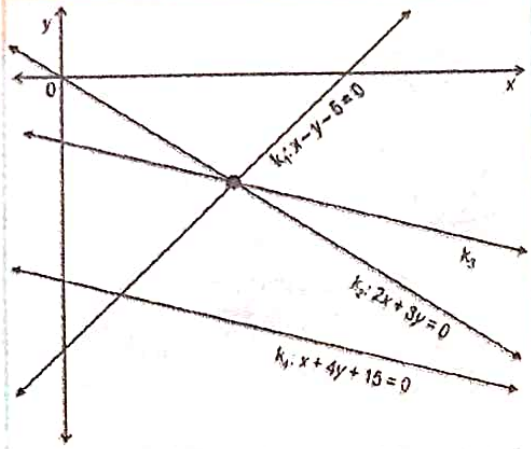

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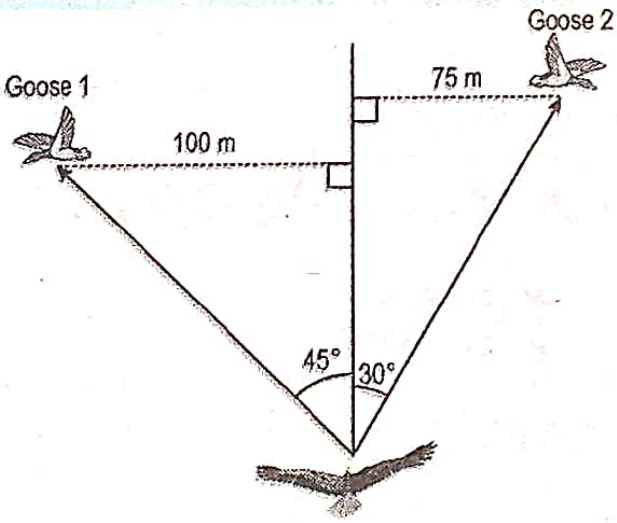

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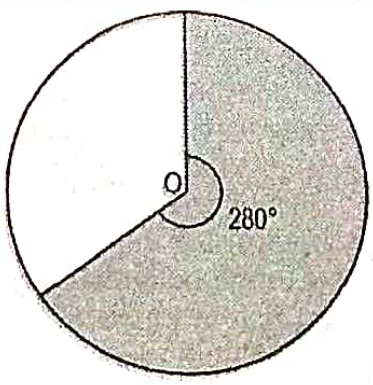

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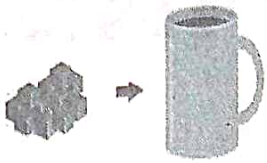

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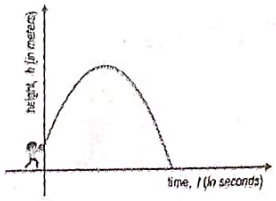

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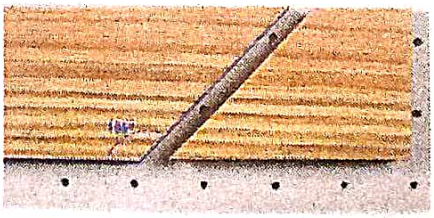

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