

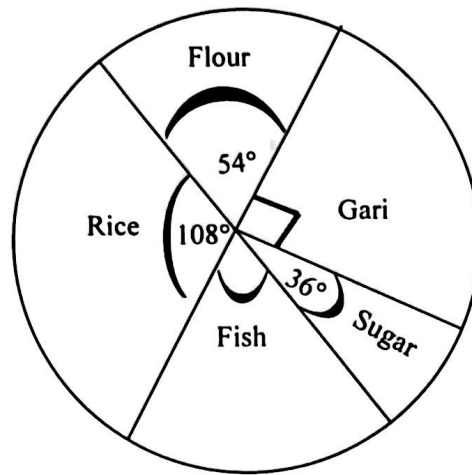
Answer four questions only.

All questions carry equal marks.

All working must be clearly shown. Marks will not be awarded for correct answers without corresponding working.

1. (a) Given that $P = \{\text{multiples of } 3\}$ and $Q = \{\text{positive even numbers}\}$ are subsets of $\mu = \{x: 1 < x \leq 20, \text{ where } x \text{ is a counting number}\}$:
- list the elements in $P \cap Q$;
 - list all the subsets in $P \cap Q$.
- (b) If $\frac{1}{y} = 3k - \frac{2}{x}$,
- make y the subject of the relation.
 - using the result in (b)(i), find the value of y when $x = -1$ and $k = 2$.
2. (a) Evaluate $\frac{4000 \times 0.35}{0.05}$, leaving the answer in standard form.
- (b) Mr Boakye gets 10 % commission on type P house he sells and 15 % on type Q house. He sells 3 type P houses at GH¢ 700,000.00 each and 4 type Q at GH¢ 1,400,000.00 each. Calculate the total commissions he makes.
3. (a) Given that $a = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$, $b = \begin{pmatrix} x \\ -3 \end{pmatrix}$ and $c = \begin{pmatrix} 7 \\ 3 \end{pmatrix}$, find:
- the value of x , if $2a + b = c$;
 - $d = c - 3a$;
 - $|d|$.
- (b) A Polytank contains 4500 litres of water and $\frac{1}{5}$ of the water is used for cleaning.
- Find the volume of water used for cleaning.
 - What percentage of water is left in the tank?
4. (a) A woman borrowed GH¢ 5,300.00 to pay for her child's university fees. If she borrowed at a rate of 8 % simple interest per annum for 9 months, find the interest paid.
- (b) A father shared his piece of land to his three children. The first child had $\frac{2}{5}$ of the land and the second had 5 acres more than the first. If the third child had 20 acres, find how many acres of land the:
- father shared;
 - first child received;
 - second child received.

5. (a) The pie chart shows the weight (in kg) of items Mrs. Mensah bought for her household.



NOT DRAWN TO SCALE

- (i) What angle represents fish?
- (ii) If she bought a total of 20 kg of items,
- (a) what is the weight of flour bought?
- (B) express, correct to one decimal place, the weight of sugar as a percentage of the weight of rice.
- (b) In a class of 30 students, five wear glasses. If a student is selected at random from the class, what is the probability that the student does **not** wear glasses?
6. Adamu was travelling a distance of 40 km from Kadumgu to Datanu. Sixty minutes after starting the journey, he made a stop at Cooltown, 10 km from Kadumgu to rest for 30 minutes. He then continued the journey from Cooltown and reached Datanu 60 minutes later.
- (a) Using a scale of 2 cm to 20 minutes on the horizontal axis and 2 cm to 5 km on the vertical axis, draw a distance-time graph for Adamu's journey.
- (b) Use the graph to determine the:
- (i) distance from Cooltown to Datanu;
- (ii) total time (in minutes), taken by Adamu to make the whole journey including the rest time;
- (iii) average speed of Adamu from Cooltown to Datanu.
- (c) If Adamu did **not** rest but travelled to Datanu within the time, what was his average speed?

END OF ESSAY TEST