

MATHS 2
570

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

JUNE 2011

ORDINARY LEVEL

Subject Title	Mathematics
Paper No.	Paper 2
Subject Code No.	570

Two and a half hours

Answer SEVEN questions.
All questions carry equal marks.
All necessary working must be shown.

*You are reminded of the necessity for good English and orderly presentation in your answers.
In calculations, you are advised to show all the steps in your working, giving your answer at each stage.*

Electronic calculators and four-figure tables may be used.

1. A farmer bought 540 day – old chicks at the cost of 2 000 FCFA for every six chicks and transported them home at 40 500 FCFA. Calculate

- (a) find the total cost of the day – old chicks
- (b) the total amount spent to have the chicks at home

The farmer fed the chicks for three months using 10 bags of feed every week. Given that each bag cost 12 500 FCFA,

- (c) calculate the amount he spent on feeding the chicks.

He paid labour at 25 000 frs CFA, per month and also spent a total of 120 000frs on vaccination.

- (d) calculate his total investment in the poultry

The farmer lost 5 fowls. Given that he sold all the remaining fowls and made a profit of 25% on his total investment,

- (e) find the selling price of each fowl to the nearest one hundred francs.

2. (i) A rectangle has a perimeter of 36cm. Given that the length of the rectangle is x cm.

- (a) Show that the width of the rectangle is $(18 - x)$ cm.

Given that the width of the rectangle is twice its width,

- (b) find the value of x ,
- (c) find the area of the rectangle, using the value of x found above.

(ii)

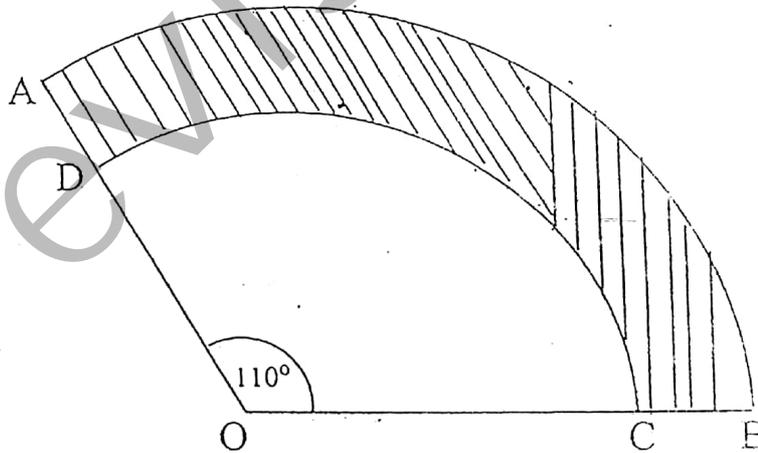


Figure 1

In figure 1, the shaded area shows a circular shaped flower bed ABCD, where AB and CD are arcs of circles, centre O.

The larger circle has radius 3.5 m and the smaller a radius of 1.5m. A fence, made of barbed wire is used to enclose the flower bed.

Find, to one decimal place,

- (a) the total length of the fence,,
- (b) the area of the flower bed

3. (i) The three sets F, G, and H are defined as follows:
- $$F = \{\text{factors of } 20\}$$
- $$G = \{\text{factors of } 24\}$$
- $$H = \{\text{Integers, } x : 7 < x < 12\}$$
- (a) List all the members of F, G, and H
 (b) State $n(G)$
 (c) Given that ξ is a universal set, draw a venn diagram to show the relationship between all these sets, fitting all the elements in their appropriate regions.

- (ii) In a survey of 120 students who buy from the school canteen,
 81 students bought biscuits
 68 bought pencils
 42 bought both biscuits and pencils

Calculate the number of students who bought

- a) at least one of the items
 b) exactly one of the items
 c) only pencils
 d) neither pencils nor biscuits

- 4 Given the functions g and h defined on IR, the set of real numbers, as

$$g : x \mapsto x + 2 \text{ and } h : x \mapsto \frac{1}{x + 2}, x \neq -2$$

- (a) Give a reason why in the function h, x cannot take the value -2
 (b) Evaluate $g(2)$ and $h(-3)$

Find, expressing in a similar manner as above, an expression for

- (c) $h(x + 1)$,
 (d) $goh(x)$,
 (e) Find two values of x for which $g^{-1}(x) = h^{-1}(x)$

5. (i) When the expression $f(x)$ is divided by $(x - 1)$, the quotient is $3x^2 + 5x + 2$ and the remainder is 0

- (a) Show that $f(x) \equiv 3x^3 + 2x^2 - 3x - 2$.
 (b) Show that $(x + 1)$ is a factor of $f(x)$,
 (c) Hence factorise $f(x)$ completely.

- (ii) The nth term of an arithmetic progression is given by $T_n = 2n - 5$.

- (a) Find the first term and the common difference of the sequence.
 (b) Hence, find the sum of the first 20 terms.

- (iii) Y varies inversely as the square of X. Given that $y = 1$ when $x = 4$, find the values of x when $y = \frac{1}{4}$

6. (i)

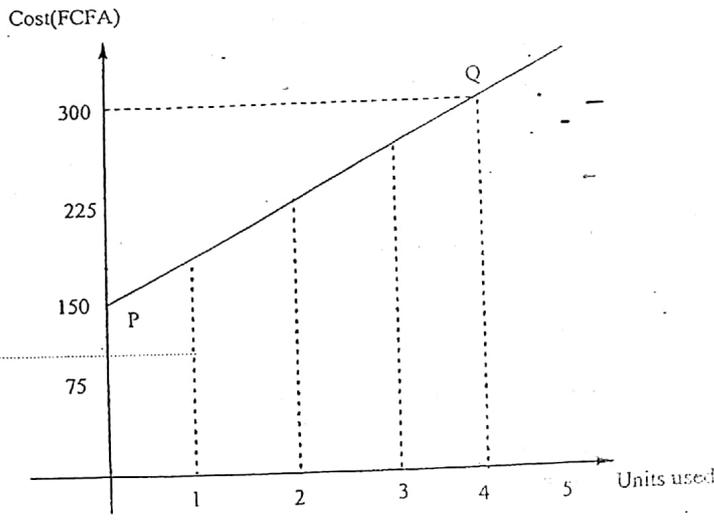


Figure 2

This graph in figure 2 illustrates the charges made by an electricity company. Using this graph

- (a) state the overhead charge
- (b) calculate the gradient of the line PQ
- (c) find the cost of electricity when 15 units are used.

(ii) Given that $y = x^2 - 2x + 1$,

(a) copy and complete the following table, for $-4 \leq x \leq 4$

x	-4	-3	-2	-1	0	1	2	3	4
y	25			3	1				

(b) Taking 1 cm to represent 1 unit on the x-axis and 2cm to represent 5 units on the y-axis, draw the graph of $y = x^2 - 2x + 1$

(c) Use your graph to find

- (i) the roots of the equation $x^2 - 2x + 1 = 0$
- (ii) the values of x for which $x^2 - x - 6 = 0$

7. (i)

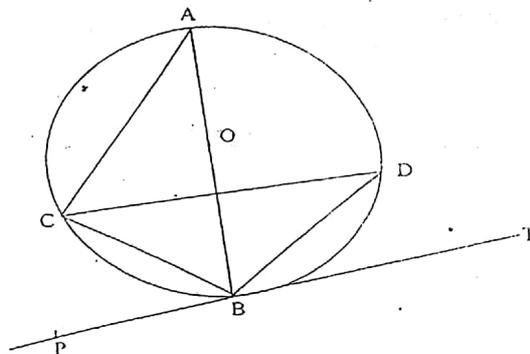


Figure 3

In figure 3, O is the centre of the circle and PT is a tangent to the circle at B. Calculate the size of

- (a) angle ACB.
 - (b) angle ACD.
- (ii) Use a ruler and compass only and show all construction lines.
- (a) Construct a circle with centre O and radius 6cm.
 - (b) Draw a diameter XOY of the circle.

At X and Y, construct lines making angles of 60° with XOY. These lines must be inside the same semi-circle. Where the two respective lines cut the circles label the points U and V. Join UV. Name

- (c) the quadrilateral XYVU
- (d) the quadrilateral XOYU
- (e) triangle VOY
- (f) the polygon formed by reflecting XYVU in the line XY

8. (i) A girl walks 6 km from a point A to a point B on a bearing of 060° . She then walks to a point C which is a distance of 12 km on a bearing of 150° .
- (a) Sketch the diagram showing her movement.
 - (b) Calculate, correct to the nearest km, the distance AC
 - (c) Calculate to the nearest degree, the bearing of A from C.

(ii)

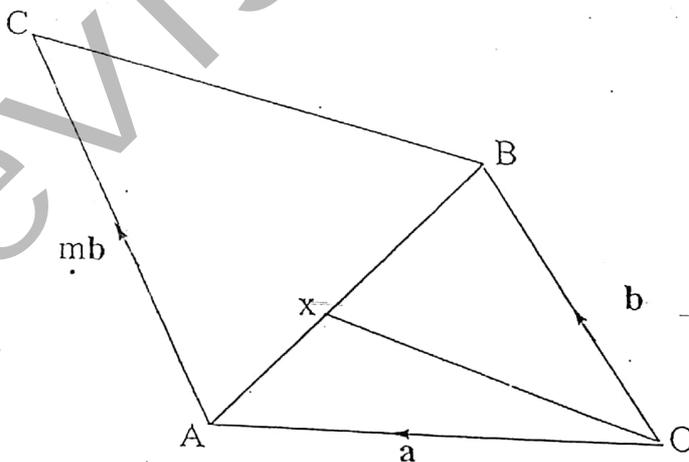


Figure 4.

In figure 4 above, AC is parallel to OB, $AX = \frac{1}{4} AB$, $OA = a$, $OB = b$ and $AC = mb$

- (a) Express in terms of a , b and m , the vectors AB , OX and BC
- (b) Given that OX is parallel to BC , find the value of m

9. (i)

Weights(g)	0-9	10-19	20-29	30-39	40-49	50-59	60-69
Frequency (f)	1	4	9	14	12	7	3

The table above shows the frequency distribution of weights, in grams, of oranges in a bag

- (a) State the mode of the distribution.
- (b) Estimate to one decimal place, the mean of the distribution.
- (c) Construct a cumulative frequency table for this distribution.

Taking 2cm to represent 5 oranges and 2cm to represent 10g, draw a cumulative frequency curve of the data.

Use your graph to estimate

- (d) The median of the distribution.
 - (e) The number of oranges that weighed less than 45g
- (ii) A bag contains 12 red sweets and y green sweets. The probability that a green sweet is taken from the bag at random is $\frac{2}{5}$
- (a) Calculate the value of y ,

Two sweets are selected from the bag at random, one after the other and without replacement.

- (b) Calculate the probability that both sweets are green.