MATHS 2
570

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

JUNE 2013

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.

Non- programmable calculators are allowed.

1. A seamstress sews a particular design and size of a dress using cotton material and lace material in the ratio 2 : 1. The cost of one metre of cotton material is 650 FCFA and the cost of one metre of lace material is 1000 FCFA. Each dress takes 3m of material.

(a) Find the total cost of material for one dress.

Other expenses for each dress amount to 1 350 FCFA.

(b) Find the total cost of making one dress

The selling price per dress is 5 700 FCFA

(c) Find the profit per dress.

(d) Express this profit as a percentage of the cost price, to the nearest whole number.

The seamstress receives an order of 35 dresses of the same size for a beauty contest at a discount of 5%.

(e) Calculate the amount she receives for the 35 dresses.

(f) Calculate the profit she made on the order.

2. (i)

Figure 1

Figure 1 above shows the uniform cross-section of a pool. Taking π as $\frac{22}{7}$, calculate:

(a) the area of the triangular part of the cross section,
(b) the area of the semi- circular part,
(c) the area of the entire cross section.

Given that water is filled into the pool to a depth of 12 m,

(d) calculate the volume of water in the pool.

(ii)

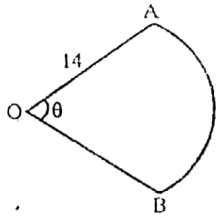


Figure 2

Given that the length of the arc in figure 2 is one and half times the radius of the circle and taking π as $\frac{22}{7}$,

(a) find, to 1 decimal place, the value of θ,

(b) find the area of the sector OAB, giving your answer to the nearest whole number.

3. (i) Given the universal set $\xi = \{\text{Student}\}$, and sets
$A = \{\text{Athletes}\}$,
$F = \{\text{Footballers}\}$,
$T = \{\text{Tennis players}\}$,

express in set language:

(a) All students took part in at least one sport.

(b) Those who are not footballers play tennis.

Express in ordinary language.

(c) $A \cup T = \emptyset$

(d) $n(A \cup F \cap T') = 0$

(ii)

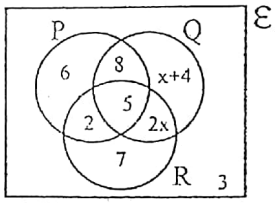


Figure 3

The diagram in figure 3 shows the relationship between the sets ε, P, Q and R.
Using the symbols $\cup$, $\cap$ and $'$ only, describe the regions having the following number of elements.

(a) 5

(b) 2x

(c) x + 4

Given that n (R) = 26,

(d) find the value of x.

Hence,

(e) find n (P $\cup$ Q).

4 (i) The functions f and g are defined on $\Re$, the set of real numbers, as follows
$f: x \mapsto 3x - 2$ and $g: x \mapsto 2x^2 + 1$

(a) Evaluate f (-1) and g $(\frac{1}{2})$.

(b) Express in a similar manner the functions gf and fg.

A function h is such that $fh: x \mapsto 1 - 6x$

(c) Find h(x), stating its domain.

(ii) Given that $p : x \mapsto \frac{3}{x-4}$, $x \neq 4$, $x \in \Re$,

(a) Find, in a similar manner, p^{-1}.

(b) Hence, state the range of $p^{-1}(x)$.

(c) Explain why p (x) = 0 is not possible

5. (i) The ages of John and Paul are respectively (5x - 4) years and (2x + 3) years. Given that John is older than Paul

(a) write down a mathematical expression in terms of x showing that John is older than Paul.

Given that Paul is 14 years younger, find
(b) the value of x,
(c) John's age.

(ii) Given that m varies inversely as the square of d and that m = 4 when d = 6, find
(a) the equation relating m and d.
(b) the value of m when d is 3

(iii) Given that $h(x) = x^2 + 2x + (k - 8)$ is divisible by x + 5, find
(a) the value of k,
(b) the other factor of h(x).

6

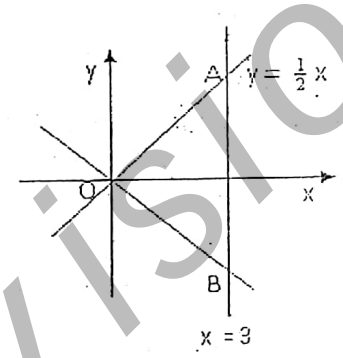


Figure 4

(i) In figure 4, the line $y = \frac{1}{2}x$ intersects the line x = 3 at A. The reflection of the line OA intersects the line x = 3 at B. Determine
(a) the coordinates of the point A.
(b) the equation of the line OB.

(ii) A boy on a tower throws a stone up in the air. The height h metres of the stone is given by $h = 5 + 4t - t^2$.
Draw a table of values of h against values of t for $0 \leq t \leq 5$.
Taking 2cm to represent 1 metre on the vertical axis and 2cm to represent 1 second on the horizontal axis, draw the graph of h against t.

Use your graph to find
(a) the height of the tower,
(b) the maximum height above the tower reached by the stone,
(c) the time the stone takes to hit the ground.

7. (i)

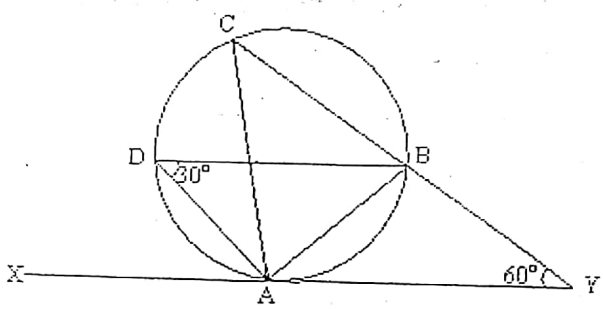


Figure 5

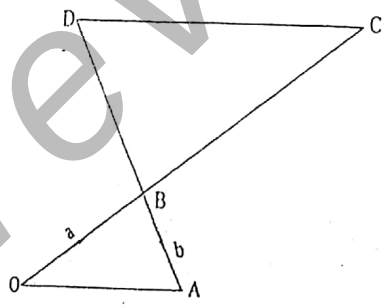
In figure 5, A, B, C and D are points on the circumference of a circle and XY is tangent to the circle at A. Given that angle CYA = 60^0 and angle ADB = 30^0,
Calculate the sizes of angle CAX and angle ABY

(ii) In this question, use a ruler and a pair of compass only and show clearly all construction lines.

(a) Draw a line AB of length 10cm
(b) Construct BD perpendicular to AB
(c) Draw the line AC = 11.5cm to meet BD at C
(d) Construct the perpendicular bisector of AB and BC to meet at O
(e) With O as centre, Construct the circle that passes through the point A, B and C.

8. (i) From a town A the town B is 60km on a bearing of 060^0 and the town C is 100km on a bearing of 330^0.
(a) Calculate the distance BC to the nearest km.
(b) Determine the bearing of B from C, to the nearest degree.

(ii)



OB = a and BA = b, BC = 2 0B , DB = 2 BA

(a) Express DC and OA in terms of a and b
(b) Show that DC is parallel to OA.
(c) State the relation between the lengths of DC and OA.

9. (i) The following table shows marks out of 60 recorded by students in a selection test.

Marks	20	25	27	28	29	30	31	32	33	34	35	37	40	47	55
Frequency	3	7	8	12	11	15	18	9	6	8	5	4	2	1	1

(a) State the mode of the marks.

Calculate,

(b) the number of students who wrote the test,
(c) the median mark,
(d) the mean mark, to 1 decimal place.

Given that in order to be selected a student must score at least 55% of the total marks, find.

(e) the pass mark,
(f) the number of students who were selected.

(ii) A bag contains six red and x green balls. A ball is drawn at random from the bag. The probability that the ball drawn is red is $\frac{2}{3}$.

Find:
(a) the value of x,
(b) the number of red balls that must be added to the bag to change the probability of drawing a red ball to be $\frac{4}{5}$.