DEPARTMENT OF EDUCATION

UPPER SECONDARY SCHOOL CERTIFICATE EXAMINATIONS

GENERAL MATHEMATICS

PAPER 2

Friday

26 October 2012

Time allowed:

2 hours 30 minutes

(8:00am – 10:30 am)

NO EXTRA TIME

(NO OTHER TIME)

MG_2

INSTRUCTIONS TO CANDIDATES

To be read by the external invigilator to all candidates

1. The subject code for **General Mathematics** is **4**.
2. There are **4** printed pages in the question booklet and **6 printed** pages in the answer booklet.
3. Write down your name, your school name and your 10-digit candidate number on the Section B Answer Sheet Provided.
4. This paper contains 10 Short Answer Questions worth 5 marks each.

Total: 50 marks

Answer **ALL** questions.

5. SHOW ALL WORKING FOR FULL MARKS
6. Calculators may be used.
7. Answers written on the question paper will not be marked. Write answers neatly in spaces as allocated on the answer sheet. Answer **ALL** questions.
8. Answer all questions on the answer sheet. Answers on any other paper including rough work paper and the question paper **will not be marked**.
9. ALL working must be shown step by step to get full marks. Students may lose marks for writing down final answers only.
10. Enough spaces have been allocated for answers to every question. Questions must be answered in spaces as allocated. Answers all over the answer booklet may not be marked.
11. Correctional Fluid is not allowed on the answer sheet. Where you have made an error, cross out all the working and start on a new line.
12. Graphical Calculators are not permitted.

Penalty For Cheating Or Assisting To Cheat In National Examinations Is Non-Certification.

DO NOT TURN OVER THE PAGE

AND DO NOT WRITE

UNTIL YOU ARE TOLD TO START.

QUESTION 1

a) In a class of x pupils, the ratio of the passes to failures in a certain test was 6 to 1. Find the number of pupils who passed the test in terms of x.
(1 mark)

b) Tau, Igo and Iro share a bag of mangoes in the ratio $7:5:14$. If Igo receives 18 mangoes less than Iro, how many mangoes does Iro receive? (2 marks)

c) There is enough food at a camp to feed 300 campers for 12 days. How many days would the same amount of food last 480 campers? (2 marks)

QUESTION 2

The frequency distribution shows the distribution of Income per fortnight of a randomly selected sample.

Income	Count
100-299	55
300-499	85
500-699	150
700-899	315
900-1099	164
1100-1299	46
1300-1499	29

a) What is the sample size? [1 mark]

b) How many people earn less than K900? [1 mark]

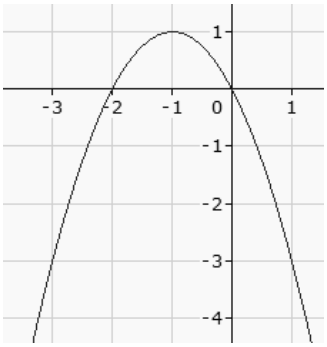
c) What is the range of the Income? [1 mark]

d) What is the midpoint Income of the third class? [1 mark]

e) Plot a histogram to picture the Income distribution. [1 mark]

QUESTION 3

Study the graph below and answer the following questions.



a) Find the equation of the parabola (2 marks)

b) Find the coordinates at which the parabola intersects the line $y = 2x + 3$ (3 marks)

QUESTION 4

A ship leaves a port A and travels 215 km on a bearing of 113° to port B and then travels on a bearing of 172° to another port C, 305 km away.

a) Sketch the ships Journey (1 mark)

b) Calculate the direct distance from A to C. (2 marks)

c) What is the bearing from Port C to Port A? (2 marks)

QUESTION 5

The table below shows the data on family size x and the amount spent y on food per week. The equation of the line of best fit is $y = 112.4 + 32.7x$.

x	y
3	210
6	320
8	350
10	450

a) Draw a scatter diagram on the grid provided. [2marks]

b) What type of relationship exists between X and Y? [1 mark]

c) Interpret the coefficient of X. [1 mark]

d) Predict the amount spent on food for a family size of 12. [1 mark]

QUESTION 6

a) A formula involving force, mass and acceleration is $F = ma$. Find the value of F when $m = 12$ and $a = 3$. [1 mark]

b) Make x the subject of the formula $ax - p = t$ [1 mark]

c) The sum of three consecutive whole numbers is 168. Find the numbers. [3 marks]

QUESTION 7

The formula $I = \dfrac{PRN}{100}$ may be used to find the simple interest earned by a principle of KP invested at the rate of R% per annum for a period of N years.

a) Calculate the simple interest of K6, 000 invested at the rate of 12% for 3 years. [1 mark]

b) Calculate the principle that earned the simple interest of K500 at the rate of 15% for 5 years. [2 marks]

c) Find the rate that earned the simple interest of K450 with the principle of K8, 100 for 3 years. [2 marks]

QUESTION 8

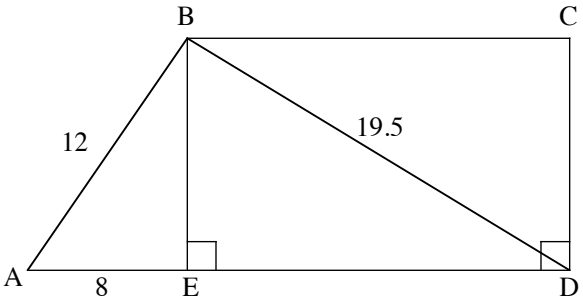
a) Sketch the parabola $y = -x^2 - x + 6$ on the grid provided. [2 marks]

b) On the same grid, sketch the exponential $y = 2^x - 5$ [2 mark]

c) Shade the region that is bounded by the parabola, the hyperbola and $x \geq 0$. [1 mark]

QUESTION 9

The following diagram is that of a quadrilateral ABCD. AB = 12, AE = 8, BD = 19.5, BE = x and DE = y. All dimensions are in metres.



a) Calculate the length BE (1 mark)

b) Calculate the length DE (2 marks)

c) Find the area of the quadrilateral ABCD (2 marks)

QUESTION 10

a) A certain shop allows cashing of cheques, but requires 5% fee for cashing of cheque and 15% worth of shopping. If the cheque is worth K875,
   (i) How much is the shopping worth? [2 marks]
   (ii) How much is the cash back?

b) Ben is a craftsman who sells his carvings at the craft market. If he sells a carving at discount of 25% that is worth K245, what is the discounted price?
   [1 mark]

c) When a shopkeeper sells an article for K135.50 he makes a profit of 25%. What is the price he paid for the article?
   [2 marks]

END OF EXAMINATION

General Mathematics '12
Paper 2 Answer Booklet

Write your province, school and candidate number, your name and your school name in the space provided below.

Year		Province		School			Candidate No		
1	2								

Candidate Name: _____

School Name: _____

This answer booklet has sections created for each question.

All answers must be written in this booklet and in the appropriate spaces provided.

	SCORE	Marker 1	Marker 2
Question 1			
Question 2			
Question 3			
Question 4			
Question 5			
Question 6			
Question 7			
Question 8			
Question 9			
Question 10			
TOTAL			

QUESTION 1

a) (1 mark)

_____

b) (2 marks)

_____

c) (2 marks)

_____

QUESTION 2

a) (1 mark)

_____

b) (1 mark)

_____

c) (1 mark)

_____

d) (1 mark)

_____

e) (1 mark)

_____

total for this question ☐ Marker 1 Marker 2		total for this question ☐ Marker 1 Marker 2

QUESTION 3

a) (2 marks)

_____

b) (3 marks)

_____

QUESTION 4

a) (1 mark)

_____

b) (2 marks)

_____

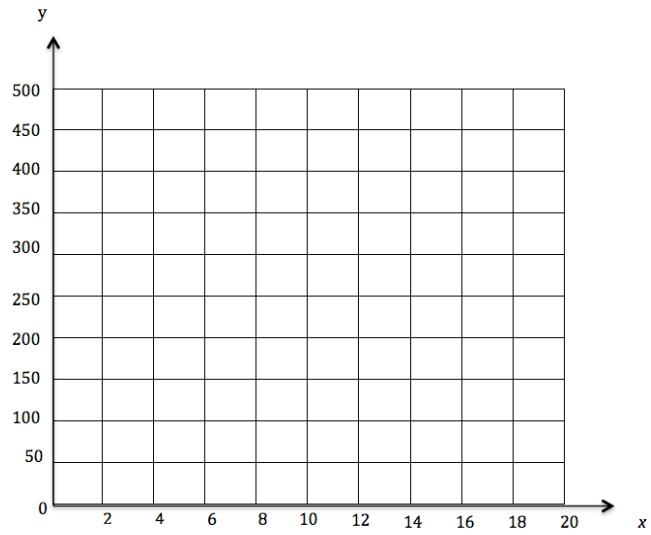
c) (2 marks)

total for this question ☐ Marker 1 Marker 2

total for this question ☐ Marker 1 Marker 2

QUESTION 5

a) (2 marks)



b)_____
_____
_____
_____(1 mark)

c)_____
_____
_____
_____(1 mark)

d)_____
_____
_____

QUESTION 6

a) (1 mark)

_____

b) (1 mark)

_____

c) (3 marks)

_____(1 mark)		_____
total for this question ☐ Marker 1 Marker 2		total for this question ☐ Marker 1 Marker 2

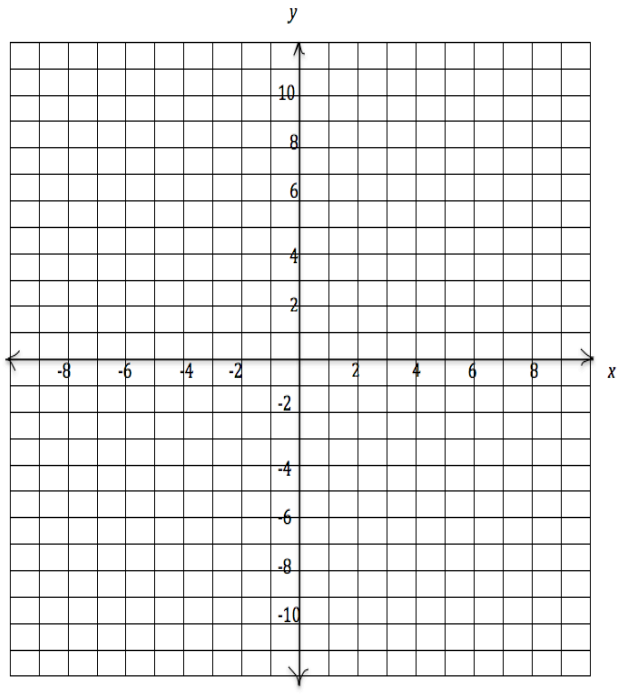
QUESTION 7.

a) (1 mark)

_____

b) (2 marks)

QUESTION 8.



a) (2 marks)

_____

c) (2 marks)

_____

total for this question ☐ Marker 1 Marker 2

b) (2 marks)

c) (1 mark)

total for this question ☐ Marker 1 Marker 2

QUESTION 9.

a) (1 mark)

_____

b) (2 marks)

QUESTION 10

a) (2marks)

_____

b) (1mark)

_____

total for this question		Marker 1 Marker 2		total for this question		Marker 1 Marker 2

UPPER SECONDARY SCHOOL CERTIFICATE EXAMINATIONS
FORMULAE SHEET FOR GENERAL MATHEMATICS

MENSURATION

Arc Length	$L = \frac{\theta}{360}\ 2\pi r$
Area of Sector	$A = \frac{\theta}{360}\ \pi r^2$
Surface Area of Cylinder	$A = 2\pi r^2 + 2\pi rh$
Surface Area of Sphere	$A = 4\pi r^2$
Curved Surface Area of Cone	$A = \pi rL$
Volume of Sphere	$V = \frac{4}{3}\ \pi r^3$
Interior Angles of Polygon	$S_n = (n - 2) \times 180^\circ$

INTEREST

Compound Interest	$A = P\left(1 + \frac{r}{100}\right)^n$

ALGEBRA

Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

ANALYTIC GEOMETRY

Distance between two points	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Mid-point of Interval	$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
Gradient of a Line	$\frac{y_2 - y_1}{x_2 - x_1} = m = \tan\theta$

TRIGONOMETRY

Sine Rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
Cosine Rule	$c^2 = a^2 + b^2 - 2ab\cos C$
Area of Triangle	$A = \frac{1}{2}\ ab\sin C$
Conversion	$\pi^c = 180^\circ$
Arc Length	$L = r\theta^c$
Area of Sector	$A = \frac{1}{2}\ r^2\theta^c$
Area of Minor Segment	$A = \frac{1}{2}\ r^2(\theta^c - \sin\theta^c)$