DEPARTMENT OF EDUCATION

UPPER SECONDARY SCHOOL CERTIFICATE EXAMINATIONS

GENERAL MATHEMATICS

PAPER 2

Friday

24th October 2014

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. The answer booklet is enclosed in the centre of this booklet. Take out the answer booklet now.
4. Check that you have the correct number of pages.
5. Write your 10 - digit candidate number, your name and your school name in the spaces provided in the answer booklet using either black or blue ink only.
6. This paper contains 10 Questions worth 5 marks each.

   Total: 50 marks

   Answer **ALL** questions.
7. Calculators, rulers and protractors are allowed.
8. Answer all questions on the answer sheet. Answers written 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 space has been allocated for the answer to every question. Questions must be answered in the spaces allocated on the Answer booklet. 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 again 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

For the data set given below, calculate the correlation coefficient by using the formula

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{\left(n\sum x^2 - \left(\sum x\right)^2\right)\left(n\sum y^2 - \left(\sum y\right)^2\right)}}.$$

x	3	8	11	16	19	22
y	41	38	39	26	19	16

(5 marks)

QUESTION 2

A pig farmer employs four workers. The market price for live pigs is K30 per kilogram. Within a certain month the farmer sells $5 \times 50\ kg$ pigs, $3 \times 60\ kg$ pigs, $2 \times 80\ kg$ pigs and pays K2, 800 as wages to his employees and K2, 000 for pig feed.

a) How much money did the farmer earn within that month?

(2 marks)

b) What is the farmer's monthly profit?

(1 mark)

c) What is the farmer's annual budget on wages and pig feed?

(2 marks)

QUESTION 3

Following are the marks obtained in a test by Grade 11 Mathematics students of Central Grammar School.
3, 8, 4, 1, 4, 8, 4, 5, 2, 6.
Find

a) the mean.

(1 mark)

b) the mean deviation.

(2 mark)

c) the standard deviation.

(2 mark)

QUESTION 4

a) Express $105:20:45:75$ in the simplest ratio.

(1 mark)

b) The lengths of A, B and C are in the ratio $2:5:3$. If the length of C is 9 metres, find the lengths of A and B.

(2 marks)

c) It takes 5 days for 12 people to harvest a field of potatoes. How long will it take 8 people to harvest the same field?

(2 marks)

QUESTION 5

a) A fair 10 - toea coin is tossed three times. What is the probability that a cuscus appears three times?

(1 mark)

b) A fair die is rolled. What is the probability that a "4" or a "6" appears?

(1 mark)

c) Are the events in (a) and (b) independent? Explain your answer.

(2 marks)

d) What is the probability that the events in (a) and (b) both occur?

(1 mark)

QUESTION 6

a) Nancy spent K26.40 buying some packets of noodles and some packets of biscuits in a supermarket. A packet of noodle cost 90 toea and a packet of biscuit cost K1.50. She bought twice as many packets of noodles as packets of biscuits.
How many packets of each did she buy?

(3 marks)

b) A class has 51 pupils. The excess of the number of males over the number of females is 13. Write one equation that represents these statements.
How many female pupils are there?

(2 marks)

QUESTION 7

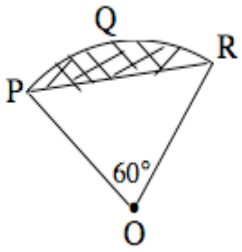

Diagram not drawn to scale

This diagram shows a sector OPQR of a circle with centre O. $OP = OR = 9.7\ cm$, $\angle POR = 60°$.

Calculate

a) the length of PR.

(1 mark)

b) the length of the arc PQR of the sector. Give your answer correct to 3 significant figures.

(2 marks)

c) the area of the shaded segment. Give your answer correct to 3 significant figures.

(2 mark)

QUESTION 8

a) Draw a diagram showing the position of 3 cities A, B and C.

C is 50 km away from A on a bearing of 206°
B is 150 km away from A on a bearing of 116°.

(2 marks)

b) Find the angle $\angle CAB$.

(1 mark)

c) Calculate the distance from B to C. Give your answer to 4 significant figures.

(2 marks)

QUESTION 9

a) The cash price of a refrigerator is K1, 550. To buy it on hire purchase, a deposit of K50 is payable plus 26 equal instalments of K80.

i) Calculate the total amount paid on hire purchase.

(1 mark)

ii) Calculate the interest paid on hire purchase.

(1 mark)

iii) Suppose the balance is paid in 20 equal instalments of K80 instead of 26 equal instalments, calculate the difference hire purchase and cash price.

(1 mark)

b) Sai wants to buy a house costing K80, 000. He pays a deposit of 20% to the bank.

i) What mortgage does he need?

(1 mark)

ii) If the bank charges K20 per month per K1, 000 borrowed, how much will he repay per month?

(1 mark)

QUESTION 10

a) Shade the region satisfied by the inequalities $3s + 7T \leq 21$ and $2T \leq 5s$, showing T on the vertical axis and the intercepts of the boundary lines on both axes.

(3 marks)

b) Is the graph of the equation $3x - 11 + 2\left(7^m\right) = 0$ a growth curve or a decay curve? Why?

(2 marks)

END OF EXAMINATION

General Mathematics '14
PAPER 2 Answer Booklet

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

Year		Province		School			Candidate No.		
1	4								

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

(5 marks)

total for this question [ ] Marker 1 Marker 2

QUESTION 2

a)

(2 marks)

b)

(1 mark)

c)

(2 marks)

total for this question [ ] Marker 1 Marker 2

QUESTION 3

a)

(1 mark)

b)

(2 marks)

c)

(2 marks)

total for this question ☐ Marker 1 Marker 2

QUESTION 4

a)

(1 mark)

b)

(2 marks)

c)

(2 marks)

total for this question ☐ Marker 1 Marker 2

QUESTION 5

a)

(1 mark)

b)

(1 mark)

c)

(2 marks)

d)

(1 mark)

total for this question ☐ Marker 1 Marker 2

QUESTION 6

a)

(3 marks)

b)

(2 marks)

total for this question ☐ Marker 1 Marker 2

QUESTION 7.

a)

(1 mark)

b)

(2 marks)

c)

(2 marks)

total for this question Marker 1 Marker 2

QUESTION 8.

a)

(2 marks)

b)

(1 mark)

c)

(2 marks)

total for this question Marker 1 Marker 2

QUESTION 9.

a) i)

(1 mark)

ii)

(1 mark)

iii)

(1 mark)

b) i)

(1 mark)

ii)

(1 mark)

total for this question Marker 1 Marker 2

QUESTION 10

a)

(3 marks)

b)

(2 marks)

total for this question Marker 1 Marker 2

HIGHER SCHOOL CERTIFICATE EXAMINATIONS 2014

FORMULAE SHEET FOR GENERAL MATHEMATICS

MENSURATION

Arc Length	$L = \frac{\theta}{360} r = 2\pi r$
Area of Sector	$A = \frac{\theta}{360} 2\pi r^2$
Area of Trapezium	$A = \frac{1}{2}(a+b)h$
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	$V = \frac{4}{3}\pi r^3$
Volume of Cone	$V = \frac{1}{3}\pi r^2 h$
Volume of Pyramid	$V = \frac{1}{3}Ah$
Interior Angles of Polygon	$s_n = (n-2)\text{x } 180^o$

TRIGONOMETRY

Sin 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	$\pi^c = 180^o$
Arc Length	$L = r\theta^c$
Area of Sector	$A = \frac{1}{2}r^2\theta^c$
Area of Minor Segment	$A = \frac{1}{2}r^2(\theta^c - sin\,\theta^\circ)$

ALGEBRA

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

INTEREST

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

STATISTICS

Mean Deviation	$\frac{\sum\lvert x-\bar{x}\rvert}{n}$
Variance	$\delta^2 = \frac{\sum(x-\bar{x})^2}{n-1} = \frac{\sum fx^2}{\sum f} - \bar{x}^2$
Standard Deviation	$\delta = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}} = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$