

From the President's Desk...



I will be stepping down from the president portfolio at the Annual General Meeting (AGM) at Congress 2012 in Potchefstroom, thereby ushering in a new era in the presidency of AMESA. It seems like yesterday when I attended what I thought was going to be a "normal" council meeting I never suspected that at the end of the meeting, I would be the president...It's been quite an experience, both challenging and exciting.

Challenging because I was hardly prepared to take up the office and the workload kept getting bigger by the day, resulting in longer hours in the office. I never would have managed without the help of Noeline, the membership secretary. Our offices at RADMASTE Centre are opposite each other and as my workload increased so did hers. My conclusion, the AMESA presidency is a full time job, hence the need to get Noeline as an assistant to help with the loads of work that pile up between National Council Meetings.

Launching our academic journal Pythagoras online has certainly been one of the most exciting moments in the history of AMESA. It took a little longer than expected, but thanks to you for your patience; it was all worth it in the end. The authors have a wider exposure of their work outside the family of AMESA; with obvious huge benefits. The open access exercise is also very costly.

Alwyn and I are trying to secure funding for the extra fees...

The Old Mutual sponsorship has sustained the printing costs of our publications since AMESA was launched in 1993. We are most grateful for their unwavering support and we are very excited that the geometry articles will again be published in the "The Teacher" newspaper in May, August and October, respectively. Jacques Du Plessis has done us proud and has once again availed himself to author the geometry articles in 2012. Your input is very critical in this regard.

Mellony Graven and Marcus Bizony have been serving as editors of the Learning and Teaching (LTM) journal since its inception in 2004. We are very proud of the increased output that the LTM journal has accomplished over the past two years, and this is largely due to the efforts of Duncan Samson. With the stepping down of Mellony as editor, the National Council has appointed Duncan as the editor in chief for LTM. We salute Mellony for her energy and enthusiasm in developing the brand, LTM, and we are most grateful that she will still serve on the editorial board.

The persistent low mathematics pass rate in the NCS examinations in 2011 is cause for concern as we embrace the implementation of the Curriculum and Assessment Policy Statement in the Foundation Phase and Grade 10. Only 46, 3% of the learners achieved 30% and above, whilst a mere 30, 1% achieved above 40%. Clearly our Grade 12 learners have serious gaps in the content knowledge which can be ascribed to numerous reasons. I am, however, encouraged that the 2011 ANA results have shifted the focus rightfully where the problems begin - in the intermediate and senior phase.

I'm also encouraged by the high level of AMESA branch activities in regions that focus on problem solving and content-

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specific workshops, in our attempt as to improve the quality of learning and teaching of mathematics in our country. The sponsorship from Edcon has made it possible for the Problem Solving Course to get off the ground. A workshop for Master Trainers will be held on the 2-4 April 2012 in Kempton Park for 4 representatives from each region.

Congratulations to the new KwaZulu Natal region Executive Committee under the leadership of Busisiwe Goba. The launch of new branches and subsequent rise in membership gives one hope that the region is well on its way to achieving greater heights. These new developments are a result of faithful members committed to developing the

Continued on page 2

region through heightening the level of activity in the branches, thereby empowering teachers in the classroom to own their professional development in mathematics education.

With great sadness, the National Council received the news of the loss of South Africa's ICME-Bid 13 to Hamburg, Germany with great sadness, especially after incredible work was invested by the LOC under the expert leadership

of Mamokgethi Setati. ICME 12 will be held in Seoul, Korea on the 8-15 July 2012. This is shortly after the AMESA Congress to be held on the 25-28 June in Potchefstroom. Let me encourage you to register early for Congress 2012. See you in Potchefstroom...

Sincerely,
Elspeth

All membership enquiries
to be forwarded to:
Ms Noeline Tomsett

Room M106 Marang Block
RADMASTE Centre
Wits University, Education Campus
Telephone: 011 484-8917
Fax: 011 484-2706
membership@amesa.org.za

NOTICE OF 2012 ANNUAL GENERAL MEETING (AGM)

The AMESA Annual General Meeting will be held at the 18th Annual National Congress to be held on the 26th June 2012 at the North West University, Potchefstroom Campus.

CALL FOR NOMINATIONS AND MOTIONS

In terms of the Association's constitution, Motions and Nominations for the 2012 AGM are hereby invited. The AGM will be held during 18th National Annual Congress at the University of North West, Potchefstroom Campus.

The term of office of the current President, Vice President and the Secretary will come to an end at the AGM and nominations for new office bearers are sought. Please nominate in accordance with the regulations listed below: The following paragraph from the constitution relates:

Procedures for nominations:

24. Nominations for Office Bearers may be submitted by any two members, a branch or a region of the Association. Such nominations must reach the National Secretary not less than three calendar months before the next Annual General Meeting (AGM).
25. All nominations shall be made in writing and must contain the names of the proposers and the consent of the person nominated. Nominations by a branch or region must be signed by at least four members of the branch committee or Regional committee.
26. The National Council shall make nominations in respect of every vacancy to which no other nomination has been received and may make nominations in addition to those received.
27. The names of all persons nominated for election at the Annual General Meeting shall be included in the agenda of the Annual General Meeting.

Procedures for motions and decision-making:

28. Any two members, a branch or a region of the Association may submit a motion to the Annual General Meeting. Any motion, on which the Annual General Meeting must vote, must reach the National Secretary not less than three calendar months before the date of the Annual General Meeting and must be included in the agenda for the Annual General Meeting.
29. Any motion that does not comply with paragraph 28 may be put to the Annual General Meeting, but may only be put to the vote if an order motion to this effect is carried unanimously by the Annual General Meeting.

Motions and Nominations must be sent to the following address:

The National Secretary	Work Tel:	013 782 0899
Isaiah Ronald Shabangu	Work Fax:	013 782 0899
P.O. Box 357	Cell:	082 929 9936/083 767 0286
MALELANE	E-mail:	secretary@amesa.org.za
1320		



AMESA 18th Annual National Congress

Theme: “Mathematics as an Educational Task”

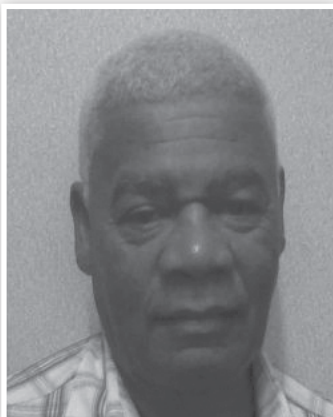
Venue: North West University, Potchefstroom Campus

Date(s): 25 - 28 June 2012

Plenary Speakers



Tim Rowland (UK) is Chair of the STeM (Science, Technology and Mathematics Education) Academic Group at the University of Cambridge, UK. Tim took an interest in mathematics from an early age, compulsively computing squares in his head whilst playing in defense for his primary school football team. He taught mathematics at a College of Education and two secondary schools before moving to teacher education and research in mathematics education. Tim has a wide range of research interests, including language and informal approaches to proof. In recent years his work has focused on the role of mathematical knowledge in teaching. He is implicated in two recent books on teacher knowledge, one jointly-authored with Cambridge colleagues; the other co-edited, and is joint editor of the journal /Research in Mathematics Education. Tim is Vice President of the International Group for the Psychology of Mathematics Education (PME), and was Chair of the International Program Committee for the Conference of European Research in Mathematics Education held in Rzeszów, Poland, in 2011. He has a completed PhD in mathematics education and an uncompleted one (which took even longer) in mathematical logic.



Cyril Julie (SA) is a professor of Mathematics education at the University of the Western Cape. He also held a similar position at the University of Agder in Norway and acted as visiting Professor at the University of Bergen. He has been involved in mathematics education since the early 1970s as a teacher, developer of resources for school mathematics, conceptualiser and director of support programmes in mathematics for learners and teachers. At UWC, he has led the conceptualisation, development and implementation of degree programmes in mathematics for teachers and mathematics. He also led the Graduate Studies in Science, Mathematics and Technology education programme - a multi-national project to develop research capacity in Sub-Saharan countries through doctoral studies. Cyril was instrumental in establishing AMESA and is a member of the Agder Society of Letters and Science in Norway. He has published widely in peer-reviewed journals, book chapters and completed two books. He has different interrelated research interests, including amongst others, the development of high-quality teaching of school mathematics, the teaching and learning of the applications of mathematics and mathematical modelling, and elementary mathematics from an advanced point of view and advanced mathematics from an elementary point of view.

IN MEMORIAM

Hanlie Murray

It was with great sadness that we received the passing away of Hanlie Murray on the 18th January 2012.

Hanlie played a very pivotal role in the mathematics curriculum development in our country and in AMESA over a long period. She was a plenary speaker at Congress 2010 in Durban and specialized in the Foundations for Learning (FFL) curriculum development in the Foundation Phase. She is going to be sorely missed. Our heartfelt condolences go to her family and friends.

May her blessed soul rest in peace.

Elspeth Khembo
on behalf of the National Council, AMESA





Makhalanyane Phillip Moeti (SA), has been teaching at Vuyani Mawethu Secondary School, in Matlosana for the past 16 years. He has taught Mathematics, Mathematical Literacy and Physical Science from Grade 10 to 12 and is currently the subject head of Mathematics and Mathematical Literacy at his school from Grade 8 to Grade 12. In 2006 he was appointed as one of eight master trainers by North West's Mathematics, Science and Technology Services (MSTS). As master trainer for mathematics, he developed training materials and trained mathematics teachers on mathematics content knowledge in relation to the National Curriculum Statement (NCS). He facilitated at numerous workshops and clinics under the auspices of AMESA, North West MSTS and South African Democratic Teachers Union (SADTU) on mathematics content and mathematics curriculum issues. He is interested in the learning and teaching of Algebra with specific focus on learners' errors and misconceptions. He believes that one of the reasons for the poor performance in secondary school mathematics is the transition from arithmetic to algebra. He harbors a notion that continuous learning is a "lived" experience that improves and extends the world.



Johann Engelbrecht (SA) is deputy dean of the faculty of Natural and Agricultural Sciences at the University of Pretoria and current director of the SA Mathematics Foundation. He was one of the founders of the international Delta movement, a southern hemisphere collaboration in the field of undergraduate mathematics education. He received awards for teaching, including the Claude Harris Leon Award "Championship in Mathematics Teaching" in 1998 and the South African Mathematical Society Award for the advancement of mathematics in 2005. Johann was the founder of the Mathematics for Undergraduates Teaching Initiative (MUTI), fostering ties between the mathematicians and other role-players, including other departments, faculties and universities and also initiated the UP mathematics competition. He was co-developer of computer courseware programmes in mathematics, co-authored two undergraduate textbooks in mathematics and developed numerous new courses and programmes in undergraduate mathematics. He represents South Africa on the International Programme Committee for ICME 2012 in Seoul.

Panel Discussions



PANEL DISCUSSION 1: Mathematics Learning in Early Childhood (Foundation Phase)

Retha van Niekerk (SA) is currently a lecturer in the School of Education at North-West University. From 1989 to the completion of her PhD in 1997, she worked with small groups (6 to 8 year old learners) in investigating the development of their overall numeracy skills with a focus on their spatial development skills. The latter formed the basis of a PhD. After the completion of the PhD in 1998 she developed the SOC (Spatial Operational Capacity) model of spatial representation in the context of "building with blocks."



PANEL DISCUSSION 2: Enacting of the Mathematics Curriculum

David Sekao holds a PhD in Mathematics Education from the University of North-West. He started his teaching career 23 years ago as a Mathematics teacher and later became Head of Department. He joined the Gauteng Department of Education (GDE) as a provincial mathematics coordinator in the GET. During his tenure as a provincial mathematics coordinator his responsibilities included the development of mathematics curricula as well as supporting subject advisors in the province on the implementation of mathematics curricula. Dr Sekao is currently in the employment of the Department of Basic Education (DBE) as a national mathematics coordinator and his primary responsibility is to develop the mathematics curriculum in the GET.



KwaZulu Natal Region

Congratulations to the newly elected Executive Committee of KwaZulu Natal elected on the 12 November 2011.

CURRENT LEADERSHIP (Elected Nov 2011-2013)

Executive	Name & Surname	Cell No.	Email Address	Institution	Work Tel
Chairperson	Busisiwe Goba	0738483377	gobab@ukzn.ac.za	UKZN	031 2607607
Vice Chairperson	Sthembiso Khanyile	0833299318	Sthe.khanyile@yahoo.com	DoBE	039 6823577
Secretary	Shanba Govender	0835765858	shanbasg@discoverymail.co.za	Austerville Prim	031 4612093
Treasurer	Dory Reddy	0837761515	dory@eject.co.za	Casio	031 4031256

New Chairperson's Remarks

Busisiwe Goba thanked God for saving her in the bus accident in Limpopo on their way from Zimbabwe. She then appealed to her newly elected Executive Committee to team up with the old committee members in the development of the region. She further promised to look for sponsors for professional development of teachers, with a special focus on primary school teachers.



Growth in membership

There was a growth in membership in KZN between July and October 2011. Membership rose from 190 to a staggering 265 by 31 October 2011, an increase of 75 members. It was also noted that there were 83 members who has already renewed their membership for 2012 in KZN (77 Individuals and 6 Institutional members). Four new branches were launched in 2011, Umlazi-umbumbulu, Empangeni, Othukela and Sisonke. Subsequently, KZN now has 11 branches. Below are the contact details of branch chairpersons.

Branch	Chairperson	Cell No.	Email Address	Institution
Durban Central	Daniel Krupanandan	0835603126	danrow@mweb.co.za	DoBE
Durban South	Harry Govender	0837127767	harrysg@telkomsa.net	Wyebank Sec
Empangeni	Thembehlele Madondo	0834371442	Thembehlele.Madondo@kzndoe.gov.za	DoBE
Lower South Coast	Sthembiso Khanyile	0833299318	Sthe.khanyile@yahoo.com	DoBE
Maphumulo	Thulani Dela	0847055007	thulanidela@24.com	Ukukhanyakwezwe
Mid-South Coast	R. Ramsugit	0846031345	rramsugit@gmail.com	
Northern Regions	Tyger Yegambaram	0832965632	tygerpy@gmail.com	Lotusville Primary
Othukela	Mdu Zwane	0722145354	zwanne@telkomsa.net	DoBE
Pietermaritzburg	David Maistry	0832319731	dmaistry@webmail.co.za	Rosethorpe Sec
Sisonke	Muzondo Frankson	0780562655	frankzondo@gmail.com	Dingeka Tech Col
Umlazi-Umbumbulu	Sthe Madonsela	0823265462	Langa.madonsela@gmail.com	Makhumbuza Sec





Branch launch at Lamontville Teachers Centre, Durban KwaZulu Natal Regional Conference

There are problem solving teacher development workshop running currently in KZN. The programme for 2012 is shown below. The presenter of these problem solving workshops is Tyger Yegambaram.

Dates	Venues	Dates	Venues	Dates	Venues
3 March	Ladysmith	5 May	Umzinto	9 June	Pietermaritzburg
10 March	Port Shepstone	19 May	Empangeni	23 June	Umlazi
21 April	Sisonke	2 June	Maphumulo	21 July	Durban South
28 July	Durban Central			4 Aug	Northern Regions

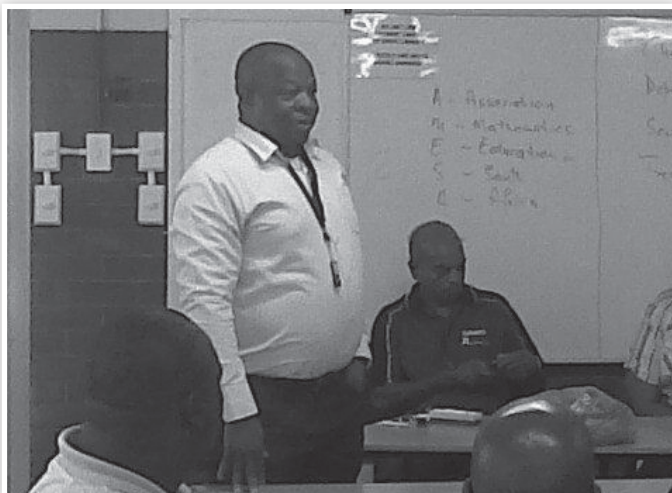
For further details on the problem solving workshops, contact

PROBLEM SOLVING COMMITTEE			
Name	Cell No.	Email Address	Institution
Tyger Yegambaram	0832965632	tygerpy@gmail.com	Lotusville Primary
Thembelihle Madondo	0834371442	Thembelihle.Madondo@kzndoe.gov.za	DoBE
Sthembiso Khanyile	0833299318	Sthe.khanyile@yahoo.com	DoBE
Logie Baskali	0837781132	baskali@telkomsa.net	Primary
Siphiwe Msimango	0733658286	cpwemcmango@gmail.com	

For workshops on curriculum matters, contact the following Curriculum Committee members:

CURRICULUM COMMITTEE			
Chairperson	Cell No.	Email Address	PHASE
Mdu Zwane	072 214 5354	zwanne@telkomsa.net	Senior
Shanba Govender	0835765858	shanbasg@discoverymail.co.za	Foundation
Sthembiso Khanyile	0833299318	Sthe.khanyile@yahoo.com	FET
Logie Baskali	0837781132	baskali@telkomsa.net	Intermediate





Branch launch at Lamontville Teachers Centre, Durban KwaZulu Natal Regional Conference

AMESA KwaZulu Natal Regional Conference

The AMESA KZN Council invites all the mathematics teachers in KZN to the Regional Conference. In an attempt to make a useful contribution towards the teaching and learning process in the province, the conference will address issues that are pertinent to all teachers in South African classrooms. The theme of the conference is ***“Innovation and change in the teaching of mathematics”***. All presentations will address the rapidly changing curriculum and technology that can be used to address topics within the curriculum.

Date: 5th May 2012
Venue: University of KwaZulu-Natal
Time: 08:00 to 15:30
Theme: ***“Innovation and Change in the Teaching of Mathematics”***

The 21st Century has thus far been characterised by various changes and innovations, namely social, economic and technological. The issue of these changes and innovations has been acknowledged and hence, we have a constant, and sometimes radical, adaptation of the school curriculum (CAPS for example). In this environment of change and innovation we are all attempting to adjust our teaching, so that we will not be left behind. Mathematics education is ideally positioned to engage with these changes and innovations. It is in this spirit that we host a conference that will expose our mathematics teachers, in a practical way, to some of these changes and innovations.

The first 300 teachers who register and attend will receive a free gift and all participants on the day will be entered into a lucky draw to win one of the four Casio Graphics calculators with an OHP screen worth almost R 1 800 each.

For further details regarding the regional conference, please contact:

Conference Director:	Busi Goba	031 260 7607	Gobab@ukzn.ac.za
Academic Co-ordinators:	Vimolan Mudaly	031 2603682	mudalyv@ukzn.ac.za
	Jaya Naidoo	031 2601127	naidooj2@ukzn.ac.za



AMESA Gauteng Regional Conference

AMESA Gauteng invites all mathematics teachers to the 2012 regional conference and Annual General Meeting to be held as follows:

Date: 5 May 2012
Time: 08:00 - 15:30
Venue: Marang Block, Wits School of Education, Parktown
Conference Director: Lwazi Mosheqane 083 516 2280 lwazimosheqane@webmail.co.za
Academic Coordinators: Khangelani Mdakane 082 352 8893 khangelanimdakane@yahoo.co.uk
Lindi Tshabalala 083 778 7905 Tshabalalaf@yahoo.com

Call for Nominations and Motions

In terms of the Gauteng Regulations, Motions and Nominations for the 2012 Gauteng AGM are hereby invited. The AGM will be held on the 5 May 2012 during the Regional Conference at the University of Witwatersrand, Education Campus, Parktown

The term of office of the current Chairperson, Vice Chairperson, Treasurer and Secretary will come to an end at the AGM and nominations for new office bearers are sought. Please nominate in accordance with the regulations listed below:

Procedures for nominations:

Nominations for Office Bearers may be submitted by any two members, or by a branch of the Gauteng region. Such nominations must reach the Secretary not less than one calendar month before the next Annual General Meeting (AGM).

All nominations shall be made in writing and must contain the names of the proposers and the consent of the person nominated. Nominations by a branch must be signed by at least four members of the branch committee.

The names of all persons nominated for election at the Annual General Meeting shall be included in the agenda of the Annual General Meeting.

Procedures for motions and decision-making:

Any two members or a branch may submit a motion to the Annual General Meeting. Any motion, on which the Annual General Meeting must vote, must reach the Secretary not less than one calendar month before the date of the Annual General Meeting and must be included in the agenda for the Annual General Meeting.

Motions and Nominations must be sent to the following address:

The AMESA Gauteng Secretary

C/O Noeline Tomsett	Work Tel:	011 484 8917
P.O Box 450	Work Fax:	011 484 2706
WITS	E-mail:	info@amesa.org.za
2050		



Learning and Teaching Mathematics (LTM) News

Learning and Teaching Mathematics has come a long way since its inception in 2004. Over the course of the last 8 years LTM has established itself as an exciting treasure trove of activities and ideas that have direct applicability to the classroom context. It is exciting to see how widely read LTM has become over the years. In addition to a steady stream of South African paper submissions, we have had numerous international submissions hailing from as far afield as the Netherlands, Canada, Ghana, Hong Kong, Israel, and the USA (Hawaii, Texas, Florida, Ohio, Indiana and South Carolina)



Duncan Samson
Rhodes University



Marcus Bizony
Bishops, Western Cape



Lindiwe Tshabalala
Gauteng Department of Education

We are delighted that Lindiwe Tshabalala is able to join the editorial team. Lindiwe's passion lies with Primary School mathematics, and part of her role on the editorial team will be to continue nurturing and growing this important aspect of the journal.



Tribute to Mellony Graven

Mellony Graven has played a leading role in guiding Learning and Teaching Mathematics (LTM) journal since its inception in 2004. She has been a beacon of vibrant energy, and has nurtured LTM over the years through her tireless enthusiasm, encouragement and advocacy. With LTM on firm footing, Mellony feels it is time for her to step down as co-editor. She will however still be a member of the Editorial Board, so her guiding wisdom will still be close at hand. On behalf of the broader mathematical community, we would like to take this opportunity to pay tribute to Mellony for all that she has done for LTM over the past 8 or so years. It has been a great privilege working with her."

Congratulations to Mellony for being elected president of SAARMSTE. We hope that she will have a prosperous and successful term of office.

Contributions or Enquiries to the LTM journal can be forwarded to LTM@amesa.org.za

August 2011



Report of the AMESA Curriculum Committee on the 2011 Senior Certificate Mathematics and Mathematics Literacy Examination Papers 25 November 2011

Introduction

The 2011 National Examinations for Mathematics and Mathematical Literacy were written on 28 October and 31 November 2011. AMESA members from various parts of the country were asked to review the papers and give constructive comment on the papers. This report is based on input received from members in AMESA regions and appears as a consolidated report.

MATHEMATICS PAPER 1 ANALYSIS

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The technical aspects of the paper are in keeping with the high standard set by the Department of Basic Education. All diagrams, graphs, etc were clear and readable

2. Language used

There was good use of language in the paper. The terminology used should have been familiar to most learners. The following issues/points were raised:

- The use of the word “an” (as opposed to “the”) in questions 6.2 ; 6.3 ; 6.4 ; 6.5 ; and 9.2 was confusing. Q 1.2.2 should have read “hence, or otherwise” - unfair question as failure to get solution for fairly tough Q 1.2.1 precludes the pupil from getting this solution as this could be done without 1.2.1.
- Question 3.3 use the word “infinite” sequence which could be confusing
- The wording in 7.3 may have been a bit ambiguous/confusing to the learners
- The language used in question 12, usually a problem area, was on the mark

3. Syllabus coverage

Code	Content/Topic	Suggested	Actual
1	Patterns & Sequences (LO1)	30	29
2	Annuities & Finance (LO1)	15	16
3	Functions & Graphs (LO2)	35	33
4	Algebraic manipulation; equations (LO2)	20	19
5	Calculus (LO2)	35	36
6	Linear Programming (LO2)	15	17
	TOTAL	150	150

4. Standard of Paper & Compliance with cognitive levels of thinking

4.1 Standard of paper

The paper was of a very high standard. It was definitely higher than the 2010 paper. It adhered to the weighting of various topics weighting and cognitive levels were in keeping with the subject assessments guidelines. One would not call any question as being unfair. However, the following comments/issues are noted:

- There were “catches” in every question! , i.e. 1.2.2 ; 2.3 ; 3.3 ; 4 ; 5.2 ; 6.6 ; 7.3 ; 9 ; 10 ; 11
- The latter questions demanded a more of mathematical understanding but were manageable.



- The simultaneous equation question, usually a standard question, was complicated.
- The proof asked in 2.3 took some learners by surprise as they were not used to doing “proof” in the new curriculum.

4.2 Compliance with levels of thinking

Levels of thinking	Suggested	November 2011
1 - Knowledge	25%	25%
2 - Routine procedures	30%	29%
3 - Complex procedures	30%	31%
4 - Solving problems	15%	15%

1. Comparison with 2010 paper
Although the paper was similar in style to the 2010 paper, the change in approach in many questions where higher order thinking was demanded, made the paper slightly more difficult than the 2010 paper.
2. Overall Observation
The feedback from those who wrote the paper was mixed with some claiming the paper the paper to be easy while others saying it was difficult. Some questions were “repeated” such as the simultaneous equations to be set up in questions 1.2.2; 4.1 and 9.1 and those who were not exposed to these types of questions would have found this difficult and could lose as much as 17 marks.

Nevertheless, it would reasonable to say that this was a fair paper, in keeping with the prescriptions of the curriculum and catering for various ability levels.

B. Question by Question Analysis:

Question 1		[19]						
Quest.	Content	Levels				Marks	Topic Code	Comment
	Algebraic manipulations and equations	1	2	3	4			
1.1.1	Quadratic equation by factorising	✓				3	4	Straightforward; fair question
1.1.2	Quadratic equation by Formula	✓				4		Straightforward; fair question
1.1.3	Quadratic inequality		✓			4		Straightforward; fair question
1.2.1	Quadratic with ratio			✓		3		Different way of asking this; what about the exclusion of $y = 0$.
1.2.2	Simultaneous equations		✓			5		If they simply use the two equations and solve simultaneously - how will this be marked? The question should possibly say hence or otherwise. If they did not get the first piece, then they lost 8 marks. An unsettling question such as this right at the start, where they are expecting routine marks for the solution of a pair of



							simultaneous equations, is off-putting, particularly for weaker candidates. The number of marks lost on it would also have been worrying for them.
TOTAL	7	9	3		19		

Question 2 [13]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Sequences	1	2	3	4			
2.1.1	AP knowing common difference	✓				2	1	Straightforward; fair question
2.1.2	GP knowing ratio		✓			3		What answers will be accepted? Rounding off would not be appropriate.
2.2	Sum of GP sigma notation			✓		4		Straightforward; fair question
2.3	Proof for Sn of AP	✓				4		Fair question with a possibility of being undermined in class; learners may lose marks
TOTAL		6	3	4		13		

Question 3 [9]

Quest.	Content	Levels				Marks	Topic Code	Comment
	AP/GP	1	2	3	4			
3.1	Combination AP/GP		✓			2	1	Combination sequence; direct application
3.2	Finding T52 of combined AP/GP		✓			5		Tricky but combined sequences have been tested before The answer is poor - same work could have been tested in a far better manner with a question that worked out in a more satisfying manner.
3.3	Proving Tn divisible by 3				✓	2		Cognitively demanding
TOTAL			7		2	9		



Question 4

[7]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Patterns	1	2	3	4			
4.1	Quadratic Patterns with simultaneous equation to find 2nd diff				✓	5	1	Cognitively demanding; involving the setting up of simultaneous equations.
4.2	Calculating first term		✓			2		Use pattern established to calculate first term
TOTAL			2		5	7		

Question 5

[19]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Hyperbola & Parabola	1	2	3	4			
5.1.1	Y int of hyperbola	✓				2	3	Straightforward; fair question
5.1.2	X int of hyperbola	✓				3		Straightforward; fair question
5.1.3	Sketch hyperbola		✓			4		Sketching known graph
5.1.4	Inequality with graph			✓		2		Selecting appropriate region and writing it correctly
5.1.5	Average gradient	✓				4		Fractions make it difficult
5.2	Sketch Parabola abstract values				✓	4		"Only one solution" is incorrect terminology - should say equal roots. It is understandable that the examiner may not have wanted to cause confusion amongst candidates who may not know this terminology, but mathematical conventions should be adhered to; learners may be unfamiliar with this type of question
TOTAL		9	4	2	4	19		



Question 6

[14]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Exp Graph & Parabola	1	2	3	4			
6.1	x & y intercepts of exponential graph		✓			4	3	Write in coordinate form
6.2	Asymptote of exp. graph	✓				1		Straightforward; fair question
6.3	$F(x)$ notation with exponents			✓		2		Substitution; new function
6.4	Inverse of exponential graph		✓			2		Marks lost if 6.3 not completed.
6.5	Reflection of exp graph			✓		1		Marks lost if 6.3 not completed.
6.6	Finding equation of parabola and applying sigma notation to equation				✓	4		“Show all working” may be deceptive as the best solution is just seen, not worked. Interesting question.
TOTAL		1	6	3	4	14		

Question 7

[16]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Finance	1	2	3	4			
7.1	Find n using logs	✓				4	2	Interpret question then do a simple calculation
7.2	Apply SI and CI formulae			✓		6		Interpretation; select appropriate formula and then justify answer
7.3	Annuities		✓			6		Interpret given information then do appropriate calculation
TOTAL		4	6	6		16		

Question 8

[12]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Calculus	1	2	3	4			
8.1	1st principles	✓				5	5	Straight forward
8.2.1	Differentiation with rule		✓			3		Write in appropriate form the use rules
8.2.2	Differentiation			✓		4		Multiply out first
TOTAL		5	3	4		12		



Question 9

[14]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Calculus	1	2	3	4			
9.1	Calculations of unknowns from drawn graphs			✓		7	5	Involved simultaneous equations for the 2nd time in paper What if given values were substituted into $f(x)$ - how will this be marked?
9.2	Equation of tangent			✓		5		Using point-gradient to find equation
9.3	Point of inflection	✓				2		Straightforward application of 2nd derivative
	TOTAL	2		7		14		

Question 10

Quest.	Content	Levels				Marks	Topic Code	Comment
	Calculus	1	2	3	4			
10.1	Given $f'(x)$ Decreasing function			✓		1	5	Straight forward analysis of drawn graph
10.2	Find min value from derivative function				✓	3		Abstract but has been examined before
	TOTAL			1	3	4		

Question 11

[6]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Calculus Application	1	2	3	4			
11.1	Finding initial volume, that is, $v(0)$	✓				1	5	Language is difficult for non-mother-tongue speakers.
11.2	Two different expressions for rate of change				✓	3		Needs careful reading
11.3	Value of k (rate)			✓		2		Requires equating of 2 expressions in 11.2; marks lost if 11.2 is wrong or not done
	TOTAL	1		2	3	6		



Question 12

[17]

Quest.	Content	Levels				Marks	Topic Code	Comment
	Linear Prog	1	2	3	4			
12.1	Setting up constraints				✓	6	6	Interpret information; write constraints
12.2	Drawing graphs			✓		4		Marks lost if 12.1 is incorrect
12.3	Transport cost		✓			1		Creating an expression in terms of x and y
12.4.1	Values of x and y so cost is a minimum			✓		3		Must use feasible region (from graphs)
12.4.2	Calculate minimum cost	✓				2		Interpret expression in 12.4.1
12.5	Change of one constraint				✓	1		New scenario but also asking for minimum cost
TOTAL		3	4	9	1	17		

Overall Total	Levels				Marks
	1	2	3	4	
All questions	38	44	46	22	150

MATHEMATICS Paper 2 ANALYSIS

A. Overall Review

- Technical Aspects (typing; diagrams; etc)**
All technical aspects of the paper are in keeping with the high standards set by the Department of Basic Education.
- Language used**
The language used in the paper would be understandable to most learners. It was precise and to the point. Learners should be familiar with the terms/words/concepts used in the paper as they would have come across these in their lessons.
- Curriculum coverage**
All work was covered as per work schedule/pace setters.

Code	Content/Topic	Suggested	Actual
1	Coordinate Geometry (LO3)	40	38
2	Transformation Geometry (LO3)	25	20
3	Trigonometry (LO3)	60	62
4	Data Handling (LO4)	25	30
	TOTAL	150	150



4. Standard of Paper & Compliance with Cognitive levels of thinking

4.1 Standard of paper

The paper was of a reasonable standard. It was well balanced and catered for a variety of ability levels. Insight and higher order thinking was needed in questions 5.7, 10.4 and 12.3.2. A number of questions required multi-step procedures.

4.2 Compliance with levels of thinking

Levels of thinking	Suggested	November 2011
1 - Knowledge	±25%	27%
2 - Routine procedures	±30%	30%
3 - Complex procedures	±30%	27%
4 - Solving problems	±15%	16%

5. Comparison with 2010 paper

Although there were various views on the comparison to the 2010 paper it would appear to be on a par with the 2010 paper and, perhaps, marginally easier than that paper.

6. Overall Observations

It would appear that the paper, although difficult in some areas, had enough marks at level 1 and level 2 (57%) for learners to pass. It would be, thus, reasonable to say that this was a fair paper, in keeping with the prescriptions of the curriculum and catering for various ability levels.

B. Question by Question Analysis:

Question 1		Data Handling (Median, IQR/box & whisker) [9]						
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
1.1	Median	✓				1	4	Straightforward
1.2	IQR		✓			3		Need to find Q1 and Q3 and then subtract
1.3	Box and whisker		✓			3		Based on a number of calculations
1.4	Comment				✓	2		Allows for guessing - should rather have asked which golfing scores lie outside one std deviation
TOTAL		1	6	-	2	9		



Question 2
Data Handling (STD Deviation and mean) [6]

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
2.1	Mean	✓				2	4	Straightforward
2.2	Standard deviation		✓			2		Use of calculator
2.3	Apply std. deviation			✓			2	Possibly too open ended.
	TOTAL	2	2	2	6			

Question 3
Data Handling (Scatter-plot)
[6]

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
3.1	Scatter-plot	✓				1	4	Question on scatter plot
3.2	Relationship between 2 variables	✓				2		Determining relationship
3.3	Conclusion based on relationship		✓			1		Reaching a conclusion
3.4	Using a value and scatter plot to predict			✓		2		Making a prediction
	TOTAL	3	1	2	6			

Question 4
Data Handling (Cumulative Frequency and Ogive) [9]

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
4.1	Cum. frequency table	✓				3	4	T and t in paper was problematic
4.2	Ogive	✓				4		Table should have been given on diagram sheet
4.3	Estimate from ogive		✓			2		
	TOTAL	7	2			9		



Question 5		Analytical Geometry					[22]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
5.1	Product of gradients					4	1	Pythagoras could also be used
5.2	Equation of straight line	✓2	✓2			4		
5.3	Calculate coordinates	✓2	✓2			4		Should only be 2 marks. Instruction should not be “calculate”, but should be “determine
5.4	Horizontal length	✓				2		
5.5	Equation of circle		✓			3		
5.6	Show point on circle		✓1	✓1		2	2	Will a geometric argument (angle in semi-circle) be acceptable?
5.7	Translation				✓	3		Sum concept seems a little contrived. Why is it stipulated that k and l are numbers
TOTAL		10	8	1	3	22		

Question 6		Analytical Geometry					[19]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
6.1	Vertical length	✓				2	1	Many may have missed the CB = 5. Statement would have helped to have it on the diagram. Co- ordinates for B should also have been on the diagram
6.2	Theorem of Pythagoras		✓			3		Note that radius is perpendicular tangent
6.3	Definition of tan θ		✓			1		
6.4	Gradient of radius		✓			2		
6.5	Point of intersection			✓		6		
6.6	Ratio of areas of Δ ^s			✓2	✓3	5		
TOTAL		2	6	8	3	19		



Question 7		Transformation Geometry					[8]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
7.1	Translation and rotation)			✓		4	2	
7.2	Reflect circle about the line $y = x$	✓2	✓2			4		Seems to be pointless to change the form of the equation of the circle.
TOTAL		2	2	4		8		

Question 8		Transformation Geometry					[9]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
8.1	Describe rotation				✓	2	2	Problem for those with poor language skills
8.2	Coordinates of image		✓			2		
8.3	Coordinates of image			✓		2		8.3 and 8.4 are new scenarios and not linked to the transformation used in 8.1 and 8.2; the question should have better phrasing
8.4	product of areas		✓			3		6.6 and 8.4 Similar feel to both questions; a contrived question - what is point of multiplying two areas?
TOTAL			5	2	2	9		

Question 9		Trigonometry					[18]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
9.1.1	Calculate trig ratio with aid of a sketch	✓				3	3	9.1.1 Should accept non- surd simplification.
9.1.2	Identity and ratio	✓				2		
9.2	Trig expression			✓		6		
9.3.1	Trig ratio from sketch	✓				2		
9.3.2	Size of angle		✓			2		
9.3.3	Find a from definition			✓		3		
	TOTAL	7	2	9		18		



Question 10		Trigonometry					[12]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
10.1	Calculate values a and b	✓2				4	3	10.1 Four marks is probably too generous.
10.2	Minimum value of “new” function	✓1	✓1			2		
10.3	Period of “new” function		✓			2	}	
10.4	Show the x-coordinate of Q is $180^\circ - \theta$			✓2	✓2	4		10.4 Question poorly phrased and may be difficult to mark. Answer may be obtained through symmetry, Too many marks allocated.
TOTAL		3	5	2	2	12		

Question 11		Trigonometry					[12]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
11.1	Area of Δ on triangular prism	✓				2	3	11. Knowledge of 3-d objects not required
11.2	Side of Δ on triangular prism		✓			3		
11.3	Height of prism			✓		3		
TOTAL		2	3	3		8		

Question 12		Trigonometry					[24]	
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
12.1	Prove identity			✓		3	3	Require complex procedures
12.2	General solution of trig equation		✓3	✓4		7		Routine problem after expressing in terms of
12.3.1	Prove identity	✓		✓2	✓1	4		Non-routine identity
12.3.2(a)	Derive from identity			✓1	✓2	3		12.3.2(a) -(c) Very probing questions; testing insight and problem solving ability
12.3.2(b)					✓	3		
12.3.2(c)					✓	4		
TOTAL		1	3	10	10	24		



Overall Total	Levels				Marks
	1	2	3	4	
All questions	40	45	41	24	150

MATHEMATICAL LITERACY PAPER 1 ANALYSIS

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The technical aspects of the paper are in keeping with the high standard set by the Department of Basic Education. All diagrams, graphs, etc were clear and readable

2. Language used

There was good use of language in the paper. The terminology used should have been familiar to most Mathematical Literacy learners. Sentences are descriptive and short.

3. Curriculum coverage

Code	Learning Outcomes	Suggested	Actual
LO1	Numbers and operations in context	37	38
LO2	Functional relationships	38	36
LO3	Space, Shape and measurement	38	42
LO4	Data Handling	37	34
	TOTAL	150	150

4. Standard of Paper and Compliance with Cognitive levels of thinking

4.1 Standard of paper

The quality of the question paper is of a good and acceptable standard. The questions are set in such a way that it is easy to distinguish between the sub-sections. Mark allocations are also indicated alongside each question. The questions in the question paper range from very easy to more advance, but not too difficult. This is in keeping with the departmental requirement that only level 1 and level 2 questions form part of Mathematical Literacy P1. In all cases where applicable formulae are given and only substitution into these were needed.

4.2 Compliance with cognitive levels of thinking

Levels of thinking	Suggested	November 2011
1 - Knowledge	±60%	59%
2 - Routine procedures	±40%	41%
3 - Non-routine procedures	0%	-
4 - Reasoning and analysis	0%	-



3. Comparison with 2010 paper

The paper was similar to the 2010 paper but possibly marginally easier.

4. Overall Observation

A very fair paper set at the appropriate grade 12 standard. Learners (and teachers) cannot complain about this paper.

C. Question by question analysis

Question 1							
Quest.	Content	Levels				Marks	Topic Code
		1	2	3	4		Comment
1.1.1	Use of calculator	✓				2	LO1
1.1.2	Rounding off	✓				2	
1.1.3	Calculation of number	✓				2	
1.1.4	Time calculation	✓				2	
1.1.5	Length	✓				2	
1.1.6	Probability		✓			2	
1.2.1	Currency		✓			2	
1.2.2	Currency		✓			3	
1.2.3	Average speed		✓			3	LO2
1.3.1(a)	Difference	✓				2	
1.3.1(b)	Difference	✓				2	
1.3.1(c)	Read off percentage	✓				3	
1.3.2(a)	Mobile device		✓			1	
1.3.2(b)	Percentage	✓				1	
1.3.2(c)	Subtraction		✓			2	
1.3.2(d)	Read off percentage	✓				3	
TOTAL		21	13				



Question 2

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
2.1.1	Read off from graph	✓				1	L02 L04	Context of face-book and twitter may be “foreign” to those without internet access
2.1.2	Read off from graph	✓				2		
2.1.3	Read off from graph	✓				1		
2.1.4	Read off from graph	✓				2		
2.1.5	Read off from graph and subtract	✓				2		
2.1.6	Conversion		✓			2		
2.2.1	Read off from pie chart	✓				1		
2.2.2	Read off from pie chart	✓				2		
2.2.3	Read off from pie chart	✓				2		
2.2.4	Calculate percentage land area from pie chart		✓			2		
2.2.5	Read off from pie chart and extrapolate		✓			3		
2.3.1	Read off from graph	✓						
2.3.2	Calculation of parking cost	✓				2		
2.3.3	Parking cost		✓			2		
2.3.4	Parking cost		✓			2		
	TOTAL	17	11			28		

Question 3

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
3.1.1	Calculation of amounts	✓	✓			8	L01 L03	Days in a month - 30 or 31?
3.1.2	Difference	✓				2		
3.1.3	Reduction of expense	✓				2		
3.2	Financial calculation		✓			3		
3.3.1	Rows and columns	✓				2		
3.3.2	Number of students	✓				1		
3.3.3	Direction	✓				2		
3.3.4	Area		✓			3		
	TOTAL	13	10			23		



Question 4

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
4.1.1	Mode	✓				2	L04	
4.1.2	Median	✓				2		
4.1.3	Median	✓				2		
4.1.4	Subtraction	✓				2		
4.1.5	Ratio		✓			3		
4.2.1	Volume		✓			3		
4.2.2	Division		✓			2		Question not clear
	TOTAL	8	8			16		

Question 5

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
5.1.1	Volume	✓				3	L03 L01 L04	Quite a bit of reading to do
5.1.2	Volume	✓				3		
5.1.3	Surface area	✓				4		
5.1.4	Surface area	✓				3		
5.2.1	Calculate number		✓			2		
5.2.2	Calculate number		✓			3		
5.2.3	Calculate number		✓			3		
5.3.1	Probability	✓				2		
5.3.2	Probability	✓				2		
	TOTAL	17	8			25		

Question 6

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
6.1.1	Missing values in table 4		✓				L02 L03	More intensive reading
6.1.2(a)	Money calculation	✓				1		
6.1.2(b)	Calculate number of goals	✓				2		
6.1.2(c)	Selecting appropriate option	✓				2		
6.1.3	Draw graph	✓				4		
6.1.4	Break-even point	✓				2		
6.2.1(a)	Length		✓			3		



Question 6 (Cont.)

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
6.2.1(b)	Area		✓			3		
6.2.2	Time calculation		✓			3		
	TOTAL	11	13			24		

Overall Total	Levels				Marks
	1	2	3	4	
All questions	87	63	-	-	150

MATHEMATICAL LITERACY PAPER 2 ANALYSIS

A. Overall Review

- Technical Aspects (typing; diagrams; etc)**
The technical aspects of the paper are in keeping with the high standard set by the Department of Basic Education. However, one province complained that some diagrams, although clear, were not easy to read because some ink had been removed.
- Language used**
This paper required a great deal of reading and interpretation. Although the language was mostly fair and within the scope of learners' reading ability, learners with a poor grasp of English would have struggled with the paper. However, learners who were taught well and were given enough practice with paper 2 type questions should have no problem with the paper.
- Curriculum coverage**

Code	Learning Outcomes	Suggested	Actual
LO1	Numbers and operations in context	37	37
LO2	Functional relationships	38	36
LO3	Space, Shape and measurement	38	35
LO4	Data Handling	37	42
TOTAL		150	150

- Standard of paper and Compliance with Cognitive levels of thinking**
NB: The graph in 1.2.3 was classified as a Learning Outcome 2 question. If it was a Learning Outcome 4 question, then the balance of the paper would have been affected. The slight tilt toward LO4 is not significant.
- Standard of paper**
The paper was of a good standard as expected for Mathematical Literacy Paper 2. Once again learners had to do a lot of reading and may have had a problem with the terminology used in the paper. 2nd language learners (with a poor grasp of English) would have probably struggled with the paper.



4.2 Compliance with cognitive levels of thinking

Levels of thinking	Suggested	November 2011
1 - Knowledge	0%	-
2 - Routine procedures	±20%	19%
3 - Multi-step procedures	±40%	42%
4 - Reasoning and reflecting	±40%	39%

5. Comparison with 2010 paper

It was not as cognitively demanding as the 2010 paper. There were a number of questions which required a great deal of reading and sifting through of information. These questions may have disadvantaged 2nd language learners

6. Overall Observation

A very comprehensive paper set at the appropriate grade 12 standard. The paper appeared to be both balanced cognitively and in terms of content coverage. We would classify this paper as being fair (in the context of what Mathematical Literacy P2 is intended to achieve)

B. Question by question analysis:

Question 1								
Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4		LO2 LO4	
1.1.1	Derive formula			✓		2		
1.1.2	Draw line graphs		✓4	✓4		8		What if the formula in 1.1.1 is incorrect?
1.1.3(a)	Graph intersection		✓			2		
1.1.3(b)	New scenario				✓	2		
1.2.1	Cost comparison				✓	8		
1.2.2	Making a choice				✓	4		
1.2.3	Criticism of misleading bar graph				✓	4		
	TOTAL		6	6	18	30		



Question 2

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
2.1.1	Checking calculations				✓	6	L01 L02	
2.1.2	Deduct VAT from calculation		✓			6		VAT = 14% should be stated
2.2.1	Interpret from graph				✓	2		
2.2.2	Calculation from graphs			✓		5		
2.3.1	Reason for not choosing				✓	1		
2.3.2	Best option				✓	3		
	TOTAL		6	5	12	23		

Question 3

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
3.1.1(a)	Distance on map		✓			2	L03	Are all maps the same?
3.1.1(b)	Scale conversion			✓		5		
3.1.2	Calculation			✓2	✓2	4		
3.1.3(a)	Checking through calculations			✓4	✓2	6		
3.1.3(b)	Routine calculation		✓			3		
3.2	Shortest possible route				✓	5		How will this question be marked?
3.3	Following directions		✓			2		
	TOTAL		7	11	9	27		

Question 4

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
4.1	Direction		✓			2	L03 L02	
4.2	Area			✓		5		How will this be marked?
4.3.1	Area			✓		10		
4.3.2	Verifying calculations			✓3	✓4	7		Too wordy
4.4	Verifying calculations			✓2	✓2	4		Too wordy
	TOTAL		2	20	6	28		



Question 5

Quest.	Content	Levels				Marks	Topic Code	Comment
		1	2	3	4			
5.1.1	Probability		✓			3		
5.1.2(a)	Calculation of missing values		✓2	✓6		8		
5.1.2(b)	Making a judgment				✓	3		
5.1.3(a)	Listing scores (percentile)			✓		3		
5.1.3(b)	Percentile comparison		✓			2		
5.1.4(a)	Verification			✓2	✓3	5		Wording may confuse learners
5.1.4(b)	Possible combination of marks			✓2	✓3	5		
5.2.1	Calculation from percentage			✓		4		
5.2.2	Probability			✓		4		Wording may confuse learners
5.2.3	Analysing results; motivate which is better				✓	5		
TOTAL			7	21	14	42		

Overall Total	Levels				Marks
	1	2	3	4	
All questions	-	28	63	59	150

Conclusion

The National Council would like to sincerely thank the Curriculum Committee for providing this very useful analysis of the Grade 12 Examinations Mathematics and Mathematics Literacy Papers.

AMESA regards the analyses of the said examination papers as a powerful teacher professional development process that has huge reflection benefits for classroom practice.

For further correspondence regarding general curriculum matters and Grade 12 examinations, please contact the Curriculum Committee Coordinators:

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Letter to the Editor...

Comments on the Old Mutual Article For the Teacher Newspaper "EUCLIDEAN GEOMETRY TEACHING The Picture tells the story - Part 1 - 3

I was really pleased to see the excellent 'geometry teaching hints' by Jacques du Plessis in the **AMESA News, Vol. 49, Nov 2011, pp. 40-45**. They are very good and certainly will be greatly helpful to teachers with the huge challenge we face with geometry coming back into the curriculum.

Jacques' highlighting of the conditions and conclusions of geometric theorems is very crucial and important. I find that even my students at university have great difficulty in geometry distinguishing the "if" and the "then" part of many geometry statements as quite often they are 'hidden' in the way in which theorems are traditionally stated in textbooks. For example, in the statement "The opposite angles of a cyclic quadrilateral are supplementary", the premise and conclusion is not always clear to some students.

Ideally, one would like to have learners and students discover geometric theorems for themselves, and then (iteratively) formulate their findings in their own words. Here it would be good to encourage them to consistently rewrite their own geometry statements (or those in the textbook) in the "if-then" or " $p \Rightarrow q$ " form. It not only improves better understanding of the premise and conclusion, but also makes it easier to formulate converses (which some of my university students do not find as trivial as one would think they should (at 3rd and 4th year level).

For example, let's consider Theorem 1 stated on p. 41 of Jacques' article: "The line segment joining the centre of a circle to the midpoint of a chord is perpendicular to it" can be rewritten as "If a line segment from the centre of a circle is drawn to the midpoint of a chord, then that line segment is perpendicular to the chord". Now when it comes to formulating converses for theorems it is important to bear in mind that it is quite often possible to formulate more than one converse.

For example, in this particular case, the following possible converses can be formulated:

- a) "If a line segment is drawn perpendicular to a chord, then it passes through the centre of the circle" - but this converse is FALSE!
- b) "If a line segment is drawn from the midpoint of a chord, then it passes through the centre of the circle" - but this 'converse' is also FALSE!
- c) "If a line segment is drawn perpendicular to the midpoint of a chord (in other words, a perpendicular bisector of a chord), then the line segment passes through the centre of the circle" - this is of course true. This is called a corollary on p. 42, but it is actually a converse, which has to be proven, and does not automatically follow from the original theorem. Be reminded that by a corollary, one technically means the result follows directly (almost immediately) from the stated or proven theorem. (Even though one might feel tempted to do so, because the proof is very similar, it doesn't follow from Theorem 1).
- d) "If a line segment from the centre of a circle is drawn perpendicular to a chord, then it will bisect that chord" - the valid converse formulated by Jacques in his paper for Theorem 1, but it is not the only converse of Theorem 1.
- e) "If a line segment from the centre of a circle is drawn to a chord, then it will bisect that chord" - but this 'converse' is also FALSE!
- f) If a line segment is drawn perpendicular to a chord, then the line segment bisects the chord and passes through the centre of the circle - but this converse is FALSE!

The difficulty with Theorem 1 is that logically we have two conditions in the premise, namely, $p =$ "line segment from centre of circle" AND $q =$ "line segment to midpoint of chord" that both have to be met so that the conclusion $r =$ "line segment is perpendicular to chord" follows. Now technically, the converse should be $r \Rightarrow (p \text{ and } q)$, which means that (f) above is really the only 'pure' converse.

However, by combining some of the conditions in the original premise with the original conclusion or ignoring some of them, we can produce other possible converses ('hybrid' or 'mutant' I sometimes like to call them) as follows:

- i) $r \Rightarrow p$ [this is (a) above and here q is ignored]
- ii) $q \Rightarrow p$ [this is (b) above, and here the original r is completely ignored - so really a very weak form of converse as it does not



even include the original r as a condition, and some would not even regard this as a converse at all, and I would tend to agree with this view]

iii) $(q \text{ and } r) \Rightarrow p$ [this is (c) above, but note that here r is combined with q , which was an original condition of the premise of theorem 1; so it is not a 'pure' converse like (f)]

iv) $(p \text{ and } r) \Rightarrow q$ [this is (d) above, but note that here r is combined with p , which was an original condition of the premise of theorem 1; so it is not a 'pure' converse like (f)]

v) $p \Rightarrow q$ (This is (e) above, but like (b) is not really a converse at all).

It may sound like splitting hairs, but think it's important to help students and learners understand theorems, and their converses better, if they looked at these different logical possibilities more carefully.

Even more so, in South Africa, where language is an issue for many learners and there's perhaps an even greater need to learn to write precisely and to interpret written mathematical statements correctly. Also it would help combat the pervasive misconception apparent even with some mathematics teachers, namely, that in geometry (if not everywhere in mathematics) converses to theorems are always true. As we can see from some of the converses above, this not true.

Many textbooks in South Africa (and elsewhere), following Euclid's Elements (see for example <http://aleph0.clarku.edu/~djoyce/java/elements/bookIII/bookIII.html#defs>), state the converse of Theorem 1 exactly as Jacques did and also call the other one (c) a corollary. However, as you can see from the above, logically there are other possibilities that could more generally be formulated and be explored in class - it can then become an even richer learning experience.

Regards

Michael de Villiers

profmd1@mweb.co.za

February 02, 2012

Please forward further comments on the Geometry Teaching Articles part 1-3, to: news@amesa.org.za

Take note: The Geometry articles will be published in "The Teacher" as per schedule below in 2012:

Geometry Article	Published in "The Teacher" Newspaper
Geometry Article No.4	11th May 2012
Geometry Article No.5	10th August 2012
Geometry Article No.6	12th October 2012

Jacques Du Plessis has once again availed himself to author the next three articles for which we are most grateful. Many thanks to Old Mutual for their generous sponsorship and collaboration with the Mail & Guardian education newspaper, "The Teacher".



“History of Mathematics in Africa: AMUCHMA 25 Years”

AMU Commission for the History of Mathematics in Africa (AMUCHMA)

We have the honour to announce the publication of the book - “History of Mathematics in Africa: AMUCHMA 25 Years” by Paulus Gerdes & Ahmed Djebbar, 924 pages in two volumes; Volume 1: 1986-1999 [ISBN 978-1-105-11807-4, 480 pp.]; Volume 2: 2000-2011 [ISBN 978-1-105-14100-3, 444 pp.]; Distribution by Lulu, Morriville NC, <http://stores.lulu.com/pgerdes>, Published October 27, 2011)

The book reproduces the thirty-seven newsletters published by AMUCHMA (African Mathematical Union Commission on the History of Mathematics in Africa) since its birth in 1986. The book celebrates the 25 years of AMUCHMA by giving a vivid picture of the activities that took place - the studies done, the queries, sources, meetings, lectures, dissertations, publications, etc are included at the end of the book with the country and name indices of authors.

The book contains Prefaces written by Professor Saliou Touré (President of the African Mathematical Union), by Professors Craig Fraser and Elena Ausejo (Chair and Secretary of the International Commission for the History of Mathematics), and by Professor Eberhard Knobloch (President of the International Academy of the History of Science). Professors Aderemi Kuku (President [1986-1995] and Honorary President of the African Mathematical Union) and Jean-Pierre Ezin (Commissioner for Human Resources, Sciences and Technology of the African Union) wrote the Afterwords.

Some extracts of the Prefaces and Afterwords included on the backcover of the book:

“I am particularly delighted to say that the successes achieved by AMUCHMA in its activities ... have been spectacular and exemplary ...” Aderemi Kuku, Honorary President of the African Mathematical Union

“I hope that this book will rapidly become reference material for use by teachers and students of the history of mathematics and all those interested in Africa’s many contributions to the advancement of science in general and mathematics in particular.” Saliou Touré, President of the African Mathematical Union

AMUCHMA “has helped to bring awareness in Africa and globally of the rich legacy of thousands of years of Africa’s mathematical contributions to the international development of mathematics.”

Jean-Pierre Ezin, Commissioner for Human Resources, Sciences and Technology, African Union Commission

“The AMUCHMA newsletters have advanced our understanding of the history of mathematics in Africa and have facilitated communication among those interested in this subject.”

Craig Fraser & Elena Ausejo, Chair and Secretary of the International Commission on the History of Mathematics

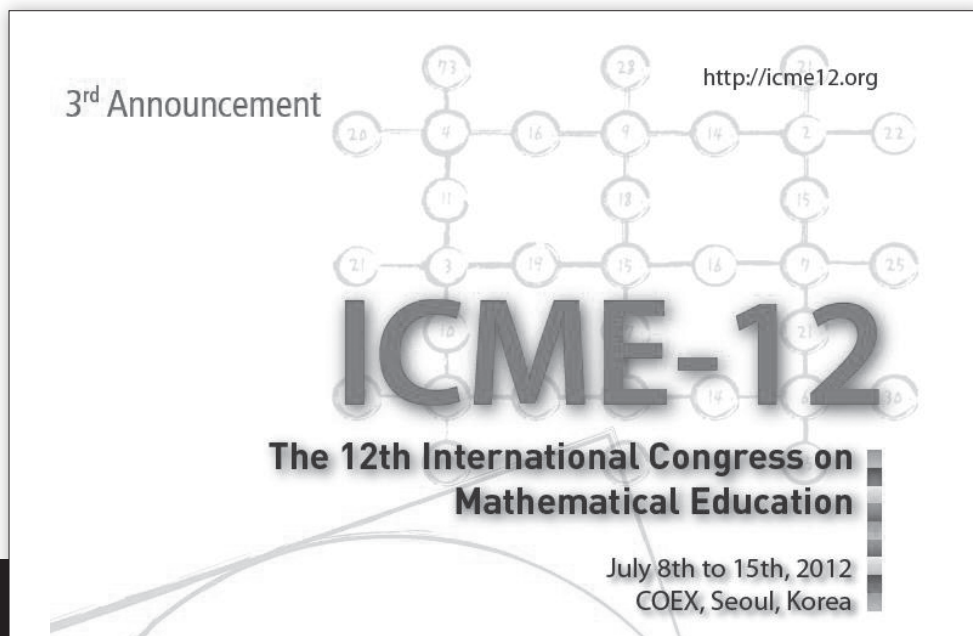
“... I would like to offer my most cordial congratulations to Paulus Gerdes and Ahmed Djebbar ... The international community of historians of science very much appreciate their work ...”

Eberhard Knobloch, President of the International Academy of the History of Science

Paulus Gerdes (paulus.gerdes@gmail.com) & **Ahmed Djebbar**
Chairman and Secretary of AMUCHMA

Paulus Gerdes Vice-President for Southern Africa, African Academy of Sciences
Chairman, AMU Commission for the History of Mathematics in Africa (AMUCHMA)
President, International Studygroup for Ethnomathematics
C.P. 915, Maputo, Mozambique
<http://stores.lulu.com/pgerdes>





3rd Announcement for the Twelfth International Congress on Mathematical Education (ICME-12)

This 3rd Announcement is the summary of what the International Program Committee (IPC) and Local Organizing Committee (LOC) have done so far, containing helpful information for all who are planning to participate in ICME-12. Check the website for more details: <http://icme12.org/>

ICME-13 Site Decision

The ICMI Executive Committee took a decision and awarded the ICME-13 bid to Hamburg, Germany.

Hamburg presented the strongest bid overall out of all six examined. Of particular strength was the size, breadth, and coherence of the team that they had put together to support the local organisation - from organisers, funders, institutional input, convention bureau, people on the ground, back-ups, and publicity, to a strong team from around the country of interested people willing to commit. Another important issue that came out in Hamburg's favour was the estimated likelihood of participant numbers.

Considering the evidence, it was concluded that Hamburg was likely to have as many as a thousand more participants than Durban because of the cost of travel.. Hamburg was stronger on finances, links with the mathematics community, outreach within the country, and accommodation accessibility

Durban presented unique opportunities provided by Africa such as its outstanding beaches and weather.

Dominating the Durban bid, however, was the strong potential for development effects in the region, that the community (teachers, educators, researchers, mathematicians, policy-makers) would be strongly enhanced by holding an ICME conference. Durban also presented a more than adequate convention centre, suitable accommodation of various kinds, good financial planning and back-up, good links with mathematics and mathematics education communities, outreach options were also very carefully considered. But the relative size of the communities: with AFRICME or SAARMSTE were still relatively small conferences compared with the several European conferences. Durban was stronger on outreach into the region, and accommodation pricing.

The National Council of AMESA wishes to thank Prof Mamokgethi Setati and the LOC for the effort, time and energy they put in leading the bid and the generous hosting of the ICMI Executive during their site visit to South Africa in April 2011. Many thanks also to the Department of Basic Education and the Department of Science and Technology, in particular Dr Phil Mjwara, Dr Cassius Lubisi from the presidency for their presence at the ICMI Executive Site visit presentation. We would also like to thank James Seymour and Sal Pillay on behalf of the staff and management of the Durban ICC for their professional support and encouragement.

"While we play to win, it is much more important to play than to win. It is through playing that we perfect our game and can somewhat change the game" concluded Prof Setati.



Statistics South Africa (STATS SA) Maths4stats - EMPOWERING EDUCATORS



From left: Professor Delia North, Head of UKZN's School of Statistics; Mathematics teacher Ms Nonkululeko Luthuli from Greytown Kwadinda Combined School; and Mr Pali Lehohla, Statistics General of South Africa and Head of Statistics South Africa, at the Maths4Stats graduation ceremony in May 2011.

Ithuba (Hope or opportunity in Zulu) is something that UKZN's School of Statistics and Actuarial Science is offering the teachers of KwaZulu-Natal, in collaborative partnership with Statistics South Africa (Stats SA) and the Department of Education (DBE). In 2011 a great milestone was reached for some 300 in-service mathematics teachers from all corners of the province, when they received their attendance certificates at the Maths4stats graduation ceremony held on the Howard College Campus. A similar ceremony had been hosted on the Pietermaritzburg Campus the previous week. Educators who had attended all the lectures in the series were awarded their certificates by representatives from the three participating institutions (UKZN, Stats SA and the KwaZulu Natal Department of Education).

First piloted at UKZN in 2010, the Maths4stats campaign is a training initiative for mathematics educators in KZN, aimed at encouraging the development of mathematics education as an important bedrock for statistics. In its second year, the Maths4stats lecture series has proven to be a great success. It offers teachers in both the general education and training (GET) and further education and training (FET) bands, courses in Data Handling (Descriptive Statistics & Probability) and Financial Mathematics. There was also a presentation by CASIO, on how to use scientific calculators in the class room, and in particular, how to use the calculator to perform statistical calculations.

On Saturdays, over a period of five months, UKZN's team of Statistics lecturers, led by Professor Delia North, volunteered their time to run "train-the-trainer" type lectures on the Pietermaritzburg and Westville Campuses. Staff who gave up their time includes Professor Temesgen Zewotir, Mr Oliver Bodhlyera, Dr Shaun Ramroop, Dr. Edmore Ranganai and Professor Henry Mwambi from the Pietermaritzburg Campus; and Professor Michael Murray, Professor Glenda Matthews, Dr Henri Moolman and Ms Arusha Desai from the Westville Campus. The university provided free venues and the mentioned lecturers, who taught the classes and ran tutorial sessions; Statistics South Africa came to the party by offering co-ordination and logistical skills under the competent baton of Lusanda Mkwenkweni, the KZN maths4stats coordinator at Stats SA; and the Department of Education disseminated registration materials to schools across the province and identified and mobilized educators to attend.

Whilst the 2010 pilot project offered lectures in the GET or FET phase, 2011 saw a third dimension added to the programme, namely, Probability and Financial Mathematics (which is the content covered in the optional Paper III in Grade 12). This new stream was added owing to the many requests received from practicing teachers, and was a resounding success. Professor Michael Murray, who wrote and delivered the Financial Mathematics notes, was responsible for setting up the Actuarial Science programme at UKZN, so his expertise was much appreciated by the teachers.

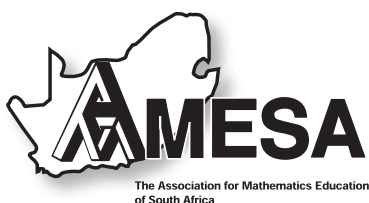


Educators spoke highly of the Maths4stats initiative. “What this programme has achieved is incredible,” said high school maths teacher, Ms Nonkululeko Luthuli. “Now we must go and teach the children.” Her friend added: “I felt privileged to walk on the grounds of a university, as I did my initial teacher training at one of the old rural teacher training colleges. We really needed this.” On hearing that graduates received not only a certificate, but also a free scientific calculator, another jubilant graduate exclaimed: “One nation, one education, one calculator!”

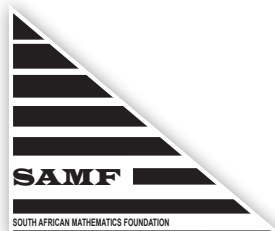
UKZN’s DVC for Teaching & Learning, Professor Renuka Vithal, challenged the teachers to return next year and sit a competency test. “While we celebrate the success of this programme,” she said, “how do you know that you know it?” Her suggestion was eagerly accepted by those teachers present, who expressed themselves willing to meet her challenge, so 2012 will see an extra dimension...not only will teachers be able to qualify for a Maths4stats attendance certificate but, for those that pass an assessment test, a further certificate of proficiency in data handling will be added. There is no doubt that the Maths4stats initiative will keep growing at UKZN and in the country in general.

Phone Stats SA on 031 3600619 for the 2012 maths4stats program or email Lusandamk@statssa.gov.za for further details.

The South African Mathematics Foundation (SAMF)



www.amesa.org.za



www.samf.ac.za



www.maths.wits.ac.za

South African Maths Foundation 2011 Annual Award Function

Prof Dirk Laurie remarked in his opening address at the SAMF Annual Awards Function, that the purpose of the evening was to honour learners who have done well and thus had won prizes in various learner development programmes. He mentioned the following programmes: SA Mathematics Olympiad; Southern African Interprovincial Mathematics Olympiad; SA Mathematics Olympiad's Training Programme; SA's participation in the International Mathematical Olympiad and the Poster competition, all aimed at promoting mathematics.

AWARD FUNCTION PROGRAMME (15 OCTOBER 2011 AT 19:00)

Lagoon Beach Hotel in Cape Town

Welcome:

Key note Address:

Master of Ceremonies- Dirk Laurie

Prof Oluwole Daniel Makinde

Senior Professor & Director of Postgraduate
Studies; Cape Peninsula University of Technology

Winners of Poster Competition:

Mr Ashley Adams

General Manager, AfriSam

S A Interprovincial Mathematics Olympiad:

Mr Wim Els

Actuarial Society of South Africa



SAMO Training Programme:

Prof Johann Engelbrecht
(Executive Director, SAMF)

International Mathematical Olympiad:

Prof Kerstin Jordaan
Council Member of the SAMS

Best Performing Schools:

Ms Elspeth Mmatladi Khembo
Chair: SAMF Board
National President, AMESA

Message from SAICA:

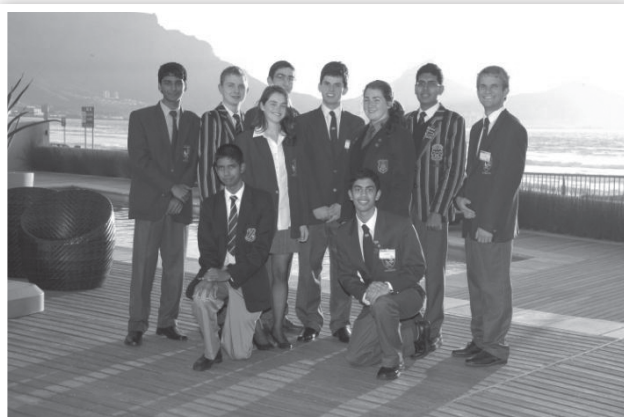
**Best Performing Learners from
Outside South Africa; Dinaledi School
Previously disadvantaged learner
Award for particular Neat Third Round Solution**

Mr Willi Coates
Senior Executive Marketing, SAICA

Message from Harmony:

Best Harmony Learners

Ms Iketleng Mogohlong
Group Skills Development Manager,
Harmony Gold Mining Company



Maths Olympiad Senior Medalists



Kamogelo Magabeane, Horizon International High School (best African learner) with Willi Coates, SAICA

Congratulations to the following learners who received awards, various prizes and certificates during the ceremony:

Winner of Poster Competition:

- Zola Zulu, Grade 10, Kharina Secondary School

SA Interprovincial Mathematics Olympiad

trophies –received by the Captains of the Teams:

- Emma Belcher, Best Junior team Western Province A
- Sean Wentzel, Best Senior team Western Province A

SA Mathematics Olympiad Training Programme Certificates:

- Ntsika Mbebe, Hilton College – Best African Learner, Junior Round 1 & 2
- Musa Ndlovu, Khanyisa Education Centre – Best African Learner, Senior Round 1 & 2
- Ethan Buckinjohn, Mondale High School – Best African Learner, Junior Round 3
- Robin Visser, St George's Grammar School –Improvement Award
- Sean Wentzel, Westerford High School – Best Performer, Senior Round 1 & 2
- Kira Düsterwald, Springfield Convent School –Best Performer, Senior Round 3
- Shaylan Lalloo, Pearson High School – Best Solution as well as Best African Learner





*Anton Demsey, Principal Jeppe Boys High School
(Best Dinaledi School) with Willi Coates (SAICA)*



*Chris Kim (junior winner), Iketleng Mogohlong (Harmony) and
Dylan Nelson (senior winner)*

- Emma Belcher, Springfield Convent School (4 awards)
 - o Best performer, Junior Round 1 & 2
 - o Best performer, Junior Round 3
 - o Best solution, Junior Round 3
 - o Commitment

International Mathematical Olympiad Medals & Certificates:

- Ashraf Moolla – Bronze Medal
- Dalian Sunder
- Dylan Nelson – Honourable Mention
- Kira Düsterwald – Bronze Medal
- Robert Spencer – Honourable Mention
- Sean Wentzel – Silver Medal

Awards to schools:

- Matavhela Secondary School – Top Participating School (Limpopo school with 839 Round 1 participants), received by the Principal Mr Madoc Ravhuanzwo.
- Horizon International High School – Best Performing Previously Disadvantaged School (Johannesburg), received by the Principal Mr Vefa Orazmyradov.
- Bishops Diocesan College – Best Performing School (Cape Town), received by Maths teacher, Ms Jenny Campbell.

Other Awards:

- Margaret Stratton, Waterford Kamhlaba College (Swaziland) – Best Performing Learner Outside South Africa
- Roger Song, Jeppe High School for Boys – Best Performing Learner from a Dinaledi School
- Kamogelo Magabeane, Horizon High School – Best Performing African Learner
- Soo-Min Lee, Bishops Diocesan College – Certificate: Particular Neat 3rd Round Solution

Best Harmony Learners:

- Nichols Naledi, Welkom High School – Best Junior Learner
- Tshilidizi Pathela, Vuwani Secondary School – Best Senior Learner

SA Mathematics Olympiad Junior Medallists –

- Adam Herman, Michael Thompson, Warren Black, Ryan Broodryk, Josiah Meyer, Soo-Min Lee Deon du Plessis, Roger Song, Nashlen Govindasamy, Robin Visser,
- Chris Kim – Gold Medal (1st Place)

SA Mathematics Olympiad Senior Medallists (the Dirk Van Rooy Medals) –

- Lloyd Mahadeo, Lauren Denny, Shaylan Lalloo, Stephen Barnes, Robert Spencer, Dalian Sunder, Ashraf Moolla, Kira Düsterwald, Sean Wentzel,
- Dylan Nelson – Gold Medal (1st Place)

For more information on Olympiads, please contact:

Ms Ellie Olivier; Tel: 012 392-9323

E-mail: ellie@samf.ac.za



South Africa won Bid to Host the International Mathematical Olympiad (IMO)

The Advisory Board of the International Mathematical Olympiad (IMO) announced that Google will support the organisation to the extent of one million Euros for the next five annual IMO events (2011-2015). This grant will help to cover the costs of this global event and ensure students from around the world continue to demonstrate their passion for mathematics.

This announcement came as good news to the South African Mathematics Foundation (SAMF) who has won the bid to host the 2014 IMO in South Africa. Hosting an IMO in South Africa will inspire South African students to greater success in the mathematics. It is widely recognized that, of all the ways of promoting and popularizing mathematics, mathematical competitions and Olympiads are by far the most cost-effective. Holding a high-profile event such as the IMO in South Africa will bring mathematics into the public eye and highlight the importance of mathematics education in South Africa's economic and technological development.

The IMO is the World Championship Mathematics Competition for high school students and is held annually in a different country. The first IMO was held in 1959 in Romania, with seven countries participating. It has gradually expanded to over 100 countries from five continents. The IMO Advisory Board ensures that the competition takes place each year and that each host country observes the regulations and traditions of the IMO. In 1992 the first South African team (consisting of 6 learners) took part in the IMO that was held in Moscow. South Africa has been a regular IMO participant every year since then.

For more information on the 2014 IMO in South Africa, please contact:

Ms Ellie Olivier;

Tel: 012 392-9323

E-mail: ellie@samf.ac.za

Free Course for Mathematics Teachers

Last week Basic Education Minister, Angie Motshekga, said her department was concerned over the number and quality of passes in mathematics and physical science, particularly given the specialised skills the country needed for its drive towards industrialisation, economic growth, and sustainable job creation.

With so many concerns about the state of the teaching of mathematics, the South African Mathematics Foundation (SAMF) in co-ordination with Dr Sudan Hansraj (UKZN) created a teacher development project, sponsored by Harmony Gold Mining Company.

The Harmony Teacher Development (HTD) project is a short course for teachers to improve their skills in solving Olympiad type mathematical problems. It is available as a live taught (GET and FET phases) or DVD course (Level 1 for GET and FET phases and Level 2 for GET phase) and certificates are issued which may be used for continuous professional development.

"We encourage all mathematical teachers to take advantage of this unique opportunity to improve their problem solving skills," says Prof Johann Engelbrecht, Executive Director of the SAMF. "Teachers can then go back to their classroom to train and enter their learners in the South African Mathematics Olympiad, which will result in a better quality of product from the schools and will put their learners in a position to reap higher achievement levels at university."

The live taught course is free of charge when a group of 20 teachers in the same area register for participation. The entry fee for the DVD course is R250 per teacher, which will be refunded when a teacher has completed the course.

For more information on how to register, contact Patrick Rasehwete

(Project Manager, SAMF) at 012 392-9348 or send an e-mail to rashwetep@samf.ac.za





Mathematics Challenge Wiskunde Uitdaging

JET MATHEMATICS PRIMARY SCHOOL INITIATIVES

Last year Edcon Discount Division's flagship clothing retail chain, Jet, agreed to sponsor the 2011 Jet Mathematics Primary School Initiatives Programme to support and promote the learning and teaching of mathematics in primary schools across South Africa.

JET South African Mathematics Challenge

Designed to compliment Government's mandate to develop and improve mathematics skills amongst primary school children, the Programme is designed to enhance the interest and performance in mathematics via the Jet South African Mathematics Challenge (previously known as the AMESA Mathematics Challenge) as well as the Jet Teacher Problem Solving Course. Both projects are organised by the South African Mathematics Foundation in cooperation with the Association of Mathematics Education of South Africa.

The First Round of the 2011 *Jet South African Mathematics Challenge* took place from 1-5 August 2011 with a total of 71 137 Grade 4-7 learners from 371 schools taking part. A total of 5 392 learners from 181 schools qualified for the Final Round, which was written the 7th of September 2011. AMESA continues to play a significant role in the competition via their Regional Organisers. The 2012 First Round will take place during the National Mathematics Week (30 July to 4 August). Learners who obtain at least 60% in the First Round qualify for the Final Round on the 5th of September.

Please visit <http://www.amesa.org.za/Challenge/> for more information - past papers and memos and contact details of the regional organiser in your area.

JET Teacher Problem Solving Course

The *Jet Teacher Problem Solving Course* will implemented this year and aims to provide a hands-on training of Grade 4-7 teachers by exposing them to a variety of problem solving strategies and techniques. It is expected that this training will enhance the problem solving skills of teachers and also improve their skill of solving Olympiad type problems. In turn, this will result in an improved appreciation for solving mathematical problems on the part of the learners.

The first training for the Problem Solving Short Course will be held on the 2-4 April 2012 in Kempton Park, Johannesburg. Thereafter, regions of AMESA will organise workshops in their branches nationwide making use of the developed DVD to enhance the problem solving skills of the teachers.

For enquiries on teacher workshops, call the South African Mathematics Foundation on 012-392-9342.
Alwyn Olivier alwyn@amesa.org.za



2012 National Mathematics Week

National Mathematics & Science Week, an initiative of the Department of Science and Technology (DST), is a countrywide celebration of mathematics and science involving various stakeholders and/or role players.

In 2008, the DST adopted a Ten-Year Innovation Plan (TYIP), which sets out a road map of transforming the local economy from a resource-based to a knowledge-based one. In light of the goal of the TYIP, the theme of the Week will be “Role of Science in Economic Development”.

The South African Mathematics Foundation (SAMF) will receive funding from the DST to host the national mathematics event in Tshwane from 30 July - 4 August 2012. Activities will include mathematics relays for learners, problem solving and Casio workshops for teachers and exhibitions by tertiary institutions, companies offering mathematical careers and publishers. Through these activities the SAMF aims to highlight the beauty, utility and applicability of mathematics and also to dispel the myth that this subject is difficult, cold, abstract, and only accessible to a few.

In addition to the national event hosted by the SAMF, the SAMF will invite AMESA provinces to submit proposals for organizing provincial activities which will contribute to the objectives of the National Mathematics & Science Week.

Date(s) 30 July - 4 August 2012
Venue: Tshwane

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2011 NATIONAL MATHEMATICS WEEK CELEBRATIONS IN WESTERN CAPE

Mathematics Relay Challenge for High School Learners (Grades 8 to 11)
(Clegg Hall, Wynberg Boys' High School: 18:45 - 21:30)

Andrew Lewis



Attendance:

Approximately 380 learners, 20 teachers and 19 schools were represented at the event: Al. Azhar, Bergvliet High School, Bishops Diocesan College, Claremont High School, Herschel Girls School, Herzlia Senior and Middle Schools, Hoerskool President, Mfuleni Secondary School, Muizenberg High School, Norman Henshilwood High School, Pinelands High School, Rustenberg Girls High School, Springfield Convent, St. Cyprians, Strandfontein Secondary School, Westerford, Wynberg Boys' High School, Wynberg Girls' High School.

Details

The turnout for this event exceeded our expectations. Schools were invited to enter teams of learners from grade 8 to grade 11, and

altogether 96 teams across these four grades registered on the evening. It was pleasing to note that the competition model proved to be workable, even with the large number of participants present at this event. Apart from a few problems with sound equipment and a miscalculation with photocopying, the evening went well, thanks to the assistance of the teachers (who had accompanied their learners), and the team of learners from Wynberg Boys' High School, who volunteered their services for the evening. The participants appeared to engage with the material and enter into the spirit of the competition. Thanks were extended to the Wynberg Boys' High School Ladies' Association for their assistance with serving refreshments, and to the support staff who had prepared the venue.

Recommendations

The main challenge with accommodating so many teams at this event was capturing and processing results. In order to streamline future events of a similar nature, it would be advisable to have a scribe or data capture dedicated to each grade



involved in the competition. If results are being processed electronically, an effort should be made to have a computer dedicated to each grade involved in the competition.

If this competition model is to be used in 2012, an effort should be made to encourage more schools in the greater Cape Town area to host competitions of their own.

The programme for this workshop was based on the format used successfully in the first two workshops. At the beginning of the workshop, participants were arranged in groups of four and given time to work through the set of questions which make up the provisional round of the competition. They were then given copies of the full set of questions for each round, together with examples of an invitation, a planning checklist, a floor plan and a scoring system used in past competitions. Hard copies of these documents were provided, together with a CD which contained electronic copies.



Andrew Lewis provided participants with his email address and that of Miss Lesley Jennings, secretary of AMESA Western Cape. Participants were advised to communicate with Lesley in regard to funding, and Andrew in regard to the competition material. As was the case in the previous workshops, participants were quick to engage with the competition material. It was interesting to see the teachers allowing their competitive streaks to emerge. It was evident that they found the questions stimulating, and the group dynamics mirrored that of the interschool competitions, so the workshop provided a useful simulation of the event.



Miss Aletta Loopuyt provided details of the funding that AMESA Western Cape is offering schools this year, thanks to sponsorship from SAMF and CASIO. Teachers were made aware of the fact the funding for any particular school is limited to a maximum of R1000. Any school wishing to qualify for this funding is required to host a legitimate event (i.e. a Mathematics competition) and provide a report of the event, together with photographs, invoices for expenses incurred and the details of the school's bank account. The report must include the names of the schools who participated in the event and the number of learners involved. Aletta indicated that, in order to qualify for funding, the report must reach Lesley Jennings by the 31st of August, after which the books would be closed.

Recommendations

Participants enquired about the availability of different material in this format. It was suggested that it would be useful to create a centralised bank of questions, online, to which teachers could be invited to contribute.

Comments from teachers in the Western Cape:

If this concept is to be used as part of AMESA Western Cape's celebration of National Mathematics Week in 2012, it would be advisable to plan for training workshops to be held earlier in the year (than was the case this year), possibly in April and/or May. In line with this, consideration should be given to publicizing the workshops during the first term.

Follow-up

Subsequent to this workshop, Andrew Lewis developed a set of questions for use with grade 7 learners, and made it available in English and Afrikaans. He invited feedback and recommendations from teachers who had shown an interest in using material aimed at primary school learners. (Ridley Esbie Thursday 21 July 2011, Cape Town - Malibu High School: 15:30 - 17:00)

The students that partook were not your average bright sparks or top students ... I would say 85% of the students that partook were average or even below average, and THAT's what made this so amazing. Therefore I could not stick to 15 min-20min a round, because they took longer to complete the question, but oh boy did they enjoy it!! And I think the beauty of the evening for me was to see those average students competing with everything in them and working flat out on MATHS! They absolutely LOVED it.



Today I could not keep them quiet ... they had so many stories to tell and I enjoyed listening). Teachers from my school, parents and important people from WCDE walked in during the competition (I think they heard the noise and came to check it out •) and they loved what they saw: 52 students from our very own town in the same hall competing in an AMESA Maths competition! So thank you for giving me the opportunity to host this. It did a lot for our students and for the unity in our community/schools. The information on the CD made life much easier and helped to make this event a success...(Stella Engelbrecht, Hoërskool Heidelberg)



Comments from learners:

"Ek het nooit geweet Wiskunde kan soveel FUN wees nie, Juffrou!"
- Gjudete van Niekerk, Graad 9

"Daar is nog baie wat ek moet leer, maar ek kan nie wag vir die volgende kompetisie nie, dan wen ons hulle" - Clinton van Rooyen



"Dankie tog hulle het nie vir ons vrae gevra nie, want dan slaan ek mos toe!" - Frans Nyeca

"Ek is bly ons kon saamwerk, want ek kan nie alleen sulke moeilike goed uitwerk nie" - Abigail Fortuin



Aan Juf Engelbrecht van Hoërskool Heidelberg, baie dankie vir al jou moeite en hard werk. Ons en die kinders het die baie geniet! Ek dink ons moet die 'n kwartaallikse kompetisie maak, al gee ons dan net een keer per jaar pryse en sertifikate. Ons sien uit na die volgende een! - A Coetzee, Kairos Sekondêr Skool

Interesting Maths Week Programme by Anita de Lange (Gardens Commercial High School, W. Cape)

As subject head of the mathematics department, I proposed that we celebrate NMW using the initiative provided by Mr. Andrew Lewis from Wynberg Boys High School @ the AMESA workshop held in July this year.

As a frontier of Mathematics Education I am filled with a passion for my subject and have always been attempting various ways to share and brush off on fellow colleagues and especially the learners.

I discussed the idea with my maths team including the student teachers, and was I pleasantly surprised with the enthusiasm. Immediately they started coming up with brilliant ideas, other than what I had in mind. It was amazing how a dream that I have always had was about to come true.



Eventually this is how the week unfolded with the following activities:

1. **An Amazing Mathematical Race**
 - a. Held from Monday to Thursday
 - b. 3 learners per class could enter
 - c. Activities for each stage were only allowed to be completed during break and after school
 - d. Each member in the Maths Team was responsible to contribute to the daily activities. Some absolutely creative ideas were given.
 - e. Educators on staff were involved in various activities according to their availability and expertise.
 - f. Prizes were awarded at the end of every leg of the race.
 - g. Whole school was allowed to watch Grand Finale during break on Thursday.
2. **A Mathematics Relay - Initiative from Andrew Lewis -WBHS**
 - a. Held on the Friday from 12h00 - 14h00.
 - b. 4 members + 1 reserve per class could enter.
 - c. Materials were supplied by Andrew Lewis WBHS.
 - d. Maths Team was in charge of venue etc..
 - e. Prizes were awarded at end of competition.
3. **Poster / Poem / Song competition**
 - a. All learners could enter this competition



- b. Posters were due Thursday
- c. About 15 Posters/poems were received
- d. Prizes were awarded to almost all because they were so creative and amazing

4. **Daily class spot prizes**

- a. Every Maths educator had a surprise question per day
- b. Every correct answer was awarded a small prize.

5. **Daily riddles with spot prizes to be pasted on walls throughout the school**

- a. Each riddle had an educators' initial who would award the prize if presented with the correct solution.
- b. Riddles were very tricky but doable

6. **Interesting Mathematical Facts / News / Information on notice boards.**

7. **Mathematics Educators wore a T-Shirt especially printed for NMW@GCHS 2011.**



The week started with a bang and ended with an explosion. To me it was a dream come true. The buzz created by NMW was so amazing that even the educators asked why they couldn't enter. Learners who at first did not seem interested at all, wanted to be part of the excitement that surrounded them. They wanted this to go on forever so that more of them could get a chance. They wanted all their subjects to do something similar. **Learners were all talking about Maths with a smile on their faces, which is not a common phenomenon in general.**

After having reflected on this most amazing week, I believe that our goals were achieved. We wanted to create an awareness of the importance, creativity, flexibility and FUN aspects that lies within the learning area Mathematics & Mathematical Literacy, and we did. We also wanted to involve all our learners and members of staff, but with the least disruption of course, and I believe we did. We wanted to create a positive attitude towards maths, and I know we did.

We might do some things a bit different next time round, but there will most definitely be a next time.

*Yours in education,
Anita de Lange (GCHS)
August 2011*

SAMF (South African Mathematics Foundation) Activities for 2012

Activity	Date
SAMO First round	19 March
UCT Mathematics Competition	16 April
SAMO Second Round	23 May
AMESA Congress (North West University)	25 to 28 June
IMO (Argentina)	04 to 16 July
Jet SA Mathematics Challenge First Round	30 July to 04 August
National Mathematics Week	30 July to 04 August
Jet SA Mathematics Challenge final round	05 September
SAMO Final Round	06 September
South African Interprovincial Mathematics Olympiad	15 September
SAMO Regional Awards Functions	17 to 27 September
SAMO, Competitions Committee workshop	12 & 13 October
SAMF Awards Function (Durban)	13 October
SAMS Congress (Stellenbosch University)	31 October to 02 November
SAMO Management Committee Meeting (Pretoria)	02 November
JET Management Committee meeting	08 November



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