

From the President's desk

Greetings to the AMESA members. AMESA continues to play a significant role in the development of mathematics education communities through various activities at the regional and branch



level. This year, we had the highest number of delegates attending the National Congress at the University of KwaZulu-Natal. We would like to express our gratitude to our members who continually support the

national congresses and other AMESA activities at the regional level. We are grateful to our sponsors such as Shuter & Shooter, Jenn Marematlou, UKZN, Pearson, CASIO, Zenex Foundation, Wits University and many more for continually support the National Congresses and regional activities. Without these sponsors, AMESA activities would not be possible..

Editor's comment



Rajendran Govender

I would like to encourage our regions and branches to send reports on their activities at a local level to AMESA News so as to share these with the wider mathematics community. In this way, we can attract more members to AMESA and continue of our work of developing mathematics teachers and learners throughout South Africa. This edition of AMESA news reports on mathematical engagements and activities at both regional and national level. **Enjoy reading!**

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Regional Activities

Most of our regions have been engaged in some very interesting and meaningful activities in 2019. We report on activities from two of our regions:

Free State

The Free State regional conference took place on Saturday 13 April 2019 at the Qwq-Qwa campus of the University of the Free State. It consisted of one plenary and a number of parallel sessions and was attended by more than 400 delegates. New Free State office bearers were also elected at the regional conference. The plenary address was delivered by KP Mofokeng. The title of the address was:

Enhancing the teaching of linear programming using the Realistic Mathematics Education approach at Technical and Vocational Education Training colleges:

The parallel sessions consisted of the following:

- How I teach topics (Foundation Phase)
- Problem solving (Intermediate and Senior Phase)
- Numeracy: Family Maths (Intermediate Phase)
- How I teach integers (Senior Phase)
- 2D shapes and 3D objects (Senior Phase)
- Patterns and relationships (Mathematical Literacy)
- Tariffs (Mathematical Literacy)
- The teaching of algebraic functions in grade 10 (FET)
- Teaching Euclidean Geometry to deaf children (FET)
- The teaching and learning of Geometry at TVET colleges using the IKS approach

AMESA Free State in pictures



**AMESA FREE STATE REGIONAL CONFERENCE AND AGM:
APRIL 2019**



AMESA FREE STATE LOC MEMBERS 2019



FREE STATE CONFERENCE ACTIVITIES



AMESA FREE STATE: MATHEMATICS COMPETITION: JULY 2019

North West

AMESA North-West also had a series of activities for its members. These are summarised as follows:

- Workshop in Potchefstroom to coincide with the launch of Dr Kenneth Kaunda branch of AMESA
- Its regional conference took place in May 2019 at the Milner High School in Klerksdorp. The conference consisted of a plenary address and parallel sessions for the different phases. More than 600 teachers attended the conference.
- The celebration of National Mathematics week with learner activities at Tlhabane Resource centre on 30 July 2019 (in Klerksdorp) and at Laerskool Deckroon on 31 July 2019 (in Madibeng)
- A provincial mathematics competition at Zeerust Combined school on 3 August 2019
- A problem solving workshop for teachers on 30 and 31 August 2019 at Letsasing High School

Pictures from North-West regional activities



**AMESA NORTH WEST: MATHEMATICS WORKSHOP:
POTCHEFSTROOM: FEBRUARY 2019**



**AMESA NORTH WEST: MATHEMATICS WORKSHOP:
POTCHEFSTROOM: FEBRUARY 2019**



**AMESA NORTH WEST: REGIONAL CONFERENCE: KLERKSDORP:
MAY 2019**



**AMESA NORTH WEST: REGIONAL CONFERENCE: KLERKSDORP:
MAY 2019**



AMESA NORTH WEST: NATIONAL MATHEMATICS WEEK: JULY 2019



**AMESA NORTH WEST: PROVINCIAL MATHEMATICS COMPETITION:
AUGUST 2019**



**AMESA NORTH WEST: PROVINCIAL MATHEMATICS COMPETITION:
AUGUST 2019**



AMESA NORTH WEST: PROBLEM SOLVING WORKSHOP: AUGUST 2019

**AMESA NATIONAL CONGRESS AT THE EDGEWOOD CAMPUS OF THE
UNIVERSITY OF KWA-ZULU NATAL HELD FROM 1 to 5 JULY 2019**

REPORT BY VIMOLAN MUDALY (CONGRESS DIRECTOR)

Preamble

Our preparation and planning for AMESA 2019 began more than 22 months in advance of the event. The LOC was formed and a small working group consisting of Dr J Naidoo, Prof R Mudaly, Mr Mkhwanazi, Mr N Ramdhani, Mr S Khanyile and myself



was set up to address the critical issues. This was besides the 15 member LOC that was formed. We were advised by Ms Busi Goba as the President of AMESA. Other smaller groups were then delegated with tasks to create an atmosphere of academic scholarship, so that we could draw people into the conference for the main purpose of assisting teachers develop their abilities to function better in their classrooms.

Some in our team worked hard and produced marvellous work, with a high standard conference. We were unfortunately disappointed with a few aspects and I will address that later in this report.

Sponsorship

Attempting to obtain funding was difficult and we have to thank Marematlou, Shuter and Shooter, the University of KwaZulu-Natal, Pearson, Zennex and Casio for their sponsorships towards making this event a success. Special mention must be made of Marematlou who sponsored 1000 bags, Shuter and Shooter for sponsoring the printing of the programmes and the proceedings and UKZN for the venues, for which we did not pay. We should to begin to look at acquiring national sponsorship for the Congresses in the future because at the local level funders are becoming rare. Without funding, the Congress would be disordered.

Administration

Despite our early planning, the administration of the registration process is an absolute nightmare. Until we begin to have an online registration process, we will continue to have people who claim they registered and were not captured or that they paid into the wrong account. The online system is working in all parts of the world and all that one needs is a cellphone and data. This is urgent and needs to be addressed. The quantity of delegates should never be the aim. Quality should always be a target. Our delegate numbers could never be confirmed even after the conference due to the system that was being used. Even the process of completing a manual form itself created problems because delegates could not spell, write legibly, and so on.

Even during the conference, it was difficult to establish exact numbers because of the long queues of delegates waiting for attention. We purchased 1700 registration tags and still

ran short of them. Somehow, somewhere, someday the AMESA EXEC needs to become proactive and procure a system that is compliant with the 21st Century advancements.

Financial administration

There is always a need to ensure that there are checks and balances to control wastage and loss of money. This is acceptable. But the idea that the LOC is dependent on the national treasurer to make payments is not a tenable idea. We had promised service providers that they would be paid within the first two weeks after the conference was over. Three weeks later, a number of vendors were still calling to query their payments

Whilst I had defended the way finances were handled at the meeting on the 30 June 2019, I regret to say that there was a rapid decay in the way it was handled in subsequent days and weeks. There needs to be established a reasonable trust between LOC members and the EXEC so that when decisions are made, there is a level of understanding and compliance.

Delegate Quality

As previously stated, I believe that our concentration on acquiring a large number of delegates is becoming detrimental to the National AMESA Congress. A quick perusal through the list of presenters at the conference will reveal that a large number of prominent researchers in South Africa did not attend the congress. Perhaps the AMESA EXEC can examine the reasons more closely but a Congress such as this should be the forum for all South African Mathematics researchers to come together to share their work with mathematics teachers. Clearly, there is some perception out there that these congresses are not achieving what we have set out to do. My observation during this process was as follows:

- Many delegates turned up without proper registration and many were clueless about how they should register
- Many of the teachers were from the foundation phase but very few presenters were prepared to present in this area
- Many of these teachers attended talks in venues that were already full and then insisted on disrupting the presentation because they did not have seats despite our pleas for them to join another group
- Many of the teachers attended the conference and sat outside the dining hall and waited for lunch or dinner despite being asked to attend the presentations – in some instances they could have caused serious harm to each other by pushing against the glass doors
- Delegate behaviour was really poor – stealing of other delegates phones, bags, food, cold drinks – other delegates witnessed this and reported to us
- Delegates created huge amounts of litter – unfortunately our old cleaners had to clear the garbage
- Delegate behaviour indicated that many attend with funding but are uncooperative during the entire five days – there should be some criteria used to select delegates

who attend the conference and a report should be submitted to the funding authorities

- Delegates arrived at the conference venue without booking accommodation and created tremendous problems for the organisers
- Delegates, who were not supposed to have breakfast and dinner at the Edgewood Canteen did so without permission
- Some people attended the conference who could not walk and simply stayed in the conference dining hall from the first day to the last, except to go to their rooms for sleeping
- We were disappointed to have heard that a group of four women told an Australian delegate and our plenary speaker that they would ‘burn this institution down’ because their food was late. Their photos were presented to us. Our assistants had to deal with appalling behaviour throughout the conference.
- From those people who reported bad behaviour to us and from our own observations, we identified two regions that produced some of this poor behaviour – they came in large numbers, had not had their registration completed correctly and insisted on all kinds of concessions. We would certainly prefer to see regional representatives playing a more active role in resolving these issues. A list of all registered delegates should be sent to the regional reps in advance so that they too can plan and prepare for the event.
- The familiar culture of ‘toyi-toying’ when we are unhappy with something became a feature of the Congress. It was also disappointing to have dealt with so many inebriated people during the 6 days. Perhaps alcohol should not be allowed during these conferences.

Our successes

We feel happy to announce that

- We have a successful congress according to those who attended most presentations
- Our programme was of a very high quality and we catered for many different areas of specialisation and this was well received
- Our special events (Cultural Evening and Gala Dinner) were absolutely well enjoyed. We tried for less formality and more enjoyment. It worked!
- Our excursions were also thoroughly enjoyed and appreciated.
- Our venue was superb especially because we did not have to pay for it!
- The small group of people who worked tirelessly to see the process to its end.

Our failures

- Our registration process – we should have gone online
- Our lunch caterer – we had no idea that she would struggle
- Our system of payments
- The Edgewood residences – we heard that they were untidy

Final Words

Congress 2019 is now over. We need to learn from it. Some important issues need to be addressed before we approach the next congress.

1. Why are so few highly rated researchers in South Africa attending the Congress?
2. Why are our teachers so untrained in the art of attending conferences – in terms of registration, payment, attendance at presentations and overall behaviour?
3. How can the process of registration be improved so that manual registrations are completely eliminated?
4. When will conference organisers be absolved from organising accommodation for delegates? Possible venues can be identified and these lists can be made available to delegates who require such accommodation. This removes the responsibility of accommodating people by the organisers themselves.
5. How can people from the lower phase areas be encouraged to present at these conferences?
6. Why do we concentrate on the quantity of delegates rather than the quality of delegates?
7. How we reduce the high demand placed on food? It is as if delegates come to eat. We should be moving towards affording the delegates the opportunity to buy their own food.
8. Delegate behaviour may be the result of AMESA's tendency to 'give-in' to delegate demands. We need to take a careful stance and curtail the privileges offered. R1200 should not offer venues, meals, paraphernalia, stationery, drinks, and so on. The PME Conference was R7000 and delegates received a cloth bag.

The Congress should not be a difficult process that leads to trepidation and ill-health. It should be one where we celebrate mathematics together, celebrate teachers and celebrate our oneness. This will not happen until we remove the notion that these conferences are solely for entertainment and food. Delegates have to understand that R1200 cannot buy them what they get. They are extremely lucky. It is not their fault that they do not understand this. It is ours. As regional representatives and heads we never find ways of disseminating this type of information. The AMESA EXEC and Regional Heads need to become extremely involved in developing a conference consciousness in our delegates. If this does not happen, no one will want to organise it in the future.

I thank the entire team and those who supported us from the EXEC. The team tried hard. We tried different ways of satisfying the delegates. From the verbal responses, it seemed that the majority enjoyed the conference.

Vimolan Mudaly

NB: We thank Vimolan Mudaly for his sterling work as Congress Director and will attempt to address some of the issues highlighted in his report.

AMESA Phase committees and teacher education report

One of the key features of AMESA Congresses are meetings of the various phase committees, as well as members involved in Teacher Education. These meetings occur on the Thursday afternoon of Congress.

The agenda for 2019 comprised the following items (amongst others): **Implementation and monitoring of the curriculum; Support of new teachers; Content training; assessment; Learner performance: successes and challenges; Mathematics competitions; Teacher self- development; other matters.**

The Teacher Education committee also meets at the same time as those of the phase committees. This meeting covered the following: **Initial Teacher education (ITE); Continuous Professional Teacher Development (CPTD) [In-service training]; Current Research in ITE and CPTD**

One hour was allocated to the meetings, which took place on Thursday 4 July 2019 at 16:35. Attendance at the meetings was reasonable. However, there is concern at the number of Mathematical Literacy teachers who attend AMESA National Congresses. In this regard, it is felt that there should be more workshops/papers for these teachers

The table below shows the phases, attendance and convenors

Phase	Number	Chairperson
Foundation Phase	69	Thotobolo Mdladlamba
Intermediate Phase	151	Kgomotso Pilane
Senior Phase	89	Mzwakhe Sokutu
FET	42	Steven Muthige
Technical Mathematics	13	Trevor Dube
Mathematical Literacy	23	Niven Ramdhani
Teacher Education and development	10	Gary Powell

For detailed phase committee reports for 2019 please open the links below:

https://www.samf.ac.za/content/files/Documents/AMESA_composite_report_on_phase_committees_and_teacher_education_2019.pdf

or

<http://amesa.org.za/Phase19.pdf>

Pictures from the 2019 AMESA Congress at the University of KwaZulu-Natal, in Pinetown



Opening ceremony



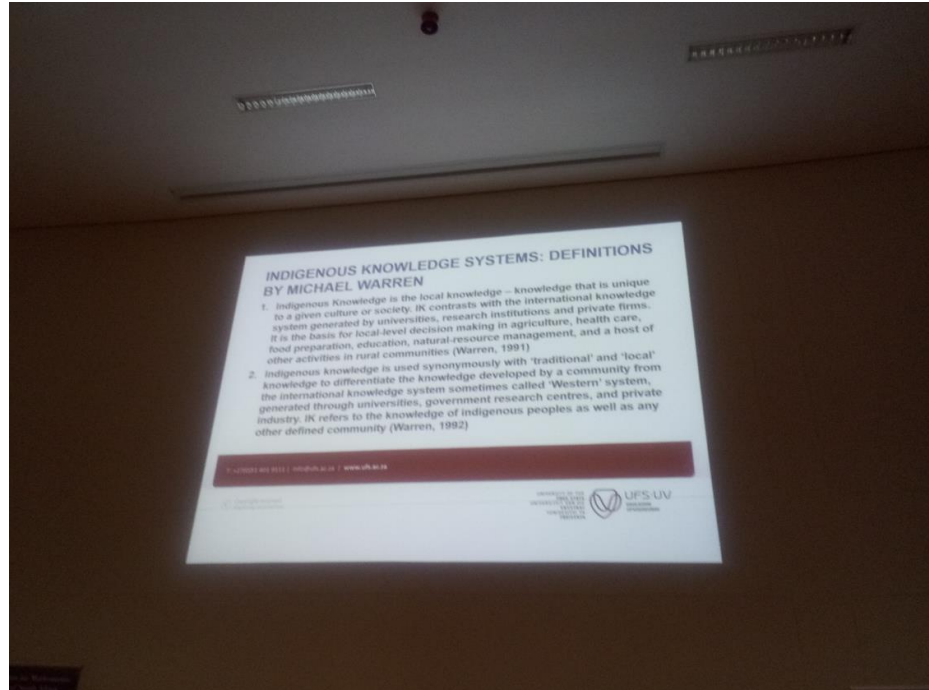
A glimpse at teachers in one session



Cultural evening



A plenary session



One of the panel discussion



Phase committee meeting (Senior Phase)



Gala evening



Gala evening address by President

AMESA Financial Statements

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA
Annual financial statements
for the year ended 31 December 2018

DE BRUYN DALY
Chartered Accountant (S.A.)
Registered Auditor
Published 26 June 2019

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA

Annual Financial Statements for the year ended 31 December 2018

Index

The reports and statements set out below comprise the annual financial statements presented to the members:

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The following supplementary information does not form part of the annual financial statements and is unaudited:

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Level of assurance

These annual financial statements have been audited in compliance with the applicable requirements of the Association's Constitution.

Published

26 June 2019

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA

Annual Financial Statements for the year ended 31 December 2018

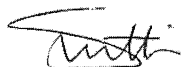
Members' Responsibilities and Approval

The members are responsible for the maintenance of adequate accounting records and the preparation and integrity of the annual financial statements and related information. The independent auditor is responsible to determine that the annual financial statements are in agreement with the accounting records, summarised in the manner required by section 58(2)(d) of the Act.

The members are also responsible for the corporation's system of internal financial control. These are designed to provide reasonable, but not absolute, assurance as to the reliability of the annual financial statements, and to adequately safeguard, verify and maintain accountability of assets, and to prevent and detect misstatement and loss. Nothing has come to the attention of the members to indicate that any material breakdown in the functioning of these controls, procedures and systems has occurred during the year under review.

The annual financial statements have been prepared on the going concern basis, since the members have every reason to believe that the corporation has adequate resources in place to continue in operation for the foreseeable future.

The annual financial statements set out on pages 4 to 9, were approved by all members on 24 June 2019 and were signed by them or on their behalf by:



Member



Independent Auditor's Report

To the members of THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA

I have audited the Income and Expenditure statements of THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA as set out on page 5. These statements are the responsibility of the Association. My responsibility is to report on the income and expenditure statements.

Members' Responsibility for the Annual Financial Statements

The Association's members are responsible for the preparation and of the annual financial statements in accordance with the basis of accounting as set out in Note 1 to the financial statements and for such internal control as the members determine is necessary to enable the preparation of annual financial statements that are free from material misstatements, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on these annual financial statements based on my audit. I conducted my audit in accordance with International Standards on Assurance Engagements. Those standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the annual financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the annual financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the annual financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the annual financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the annual financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my qualified audit opinion.

Basis for Qualified Opinion

In common with similar organisations, it is not possible for the Association to institute accounting controls over collections from subscriptions, donations, fundraising, hire of facilities and sundry income prior to the initial entry of the collections in the accounting records. Accordingly it was impracticable for me to extend my examination beyond the receipts actually recorded.

Qualified Opinion

In my opinion, except for the possible effects of the matter described in the Basis for Qualified Opinion paragraph, the annual financial statements of THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA for the year then ended 31 December 2018 are prepared, in all material respects, in accordance with the basis of accounting described in note 1 to the annual financial statements.


Alan Daly
Partner
Registered Auditor

26 June 2019
WYNBERG



Alan Daly, B.Com, B.Compt (Hons), CA(SA), PGDip(Tax)
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THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA
Annual Financial Statements for the year ended 31 December 2018

Statement of Financial Position as at 31 December 2018

Figures in Rand	Note(s)	2018	2017
Assets			
Current Assets			
Reserve fund	2	295 608	278 580
Cash and cash equivalents	3	1 012 432	894 991
		1 308 040	1 173 571
Total Assets		1 308 040	1 173 571
Equity and Liabilities			
Members' interest and reserves			
Retained income		743 920	695 935
Liabilities			
Current Liabilities			
Trade and other payables	4	564 120	477 636
Total Equity and Liabilities		1 308 040	1 173 571

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA

Annual Financial Statements for the year ended 31 December 2018

Statement of Comprehensive Income

Figures in Rand	Note(s)	2018	2017
Revenue		817 645	745 924
Other income		605 506	27 736
Operating expenses		(1 435 828)	(910 218)
Operating loss		(12 677)	(136 558)
Investment revenue		60 662	55 915
Profit (loss) for the year		47 985	(80 643)

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA

Annual Financial Statements for the year ended 31 December 2018

Accounting Policies

1. Presentation of Annual Financial Statements

The annual financial statements have been prepared in accordance with the accounting policies as set out below. The annual financial statements have been prepared on the historical cost basis. They are presented in South African Rands.

The financial statements are prepared on the Cash Basis, except for expenses relating to National Congress and Subsidy refunds due to regions which is accounted for on accrual basis.

These accounting policies are consistent with the previous period.

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA

Annual Financial Statements for the year ended 31 December 2018

Notes to the Annual Financial Statements

Figures in Rand	2018	2017
2. Reserve fund		
Term - Account 20-6641-6798	17 487	16 776
Term - Account 20-6519-7783	109 847	102 513
Term - Account 20-6245-3984	56 128	52 876
Term - Account 20-6108-0279	46 696	43 599
32 day notice - Account 91-8606-5955	65 450	62 816
	295 608	278 580
3. Cash and cash equivalents		
Cash and cash equivalents consist of:		
Bank balances	202 750	216 653
Depositor Plus account	683 188	641 349
Education fund	126 494	36 989
	1 012 432	894 991
4. Trade and other payables		
Amounts due to Regions for National Congress profits	468 734	372 130
Subsidy refunds due to regions	95 386	105 506
	564 120	477 636
Subsidy refunds due to regions		
Eastern Cape 2016	6 736	6 736
Eastern Cape 2017	6 232	6 232
Eastern Cape 2018	4 760	-
Free State 2018	27 354	-
Gauteng 2017	-	13 376
Kwazulu-Natal 2016	-	22 984
Kwazulu-Natal 2017	-	16 972
North West 2016	17 768	17 768
Northern Cape 2017	1 248	1 248
Northern Cape 2018	3 104	-
Western Cape 2016	11 116	11 116
Western Cape 2017	9 074	9 074
Western Cape 2018	7 994	-
	95 386	105 506
Profits due to regions for National Congress		
National Congress 2014 - Northern Cape	164 090	214 090
National Congress 2015 - Mpumalanga	-	8 040
National Congress 2017 - Eastern Cape	150 000	150 000
National Congress 2018 - Free State	154 644	-
	468 734	372 130
5. Taxation		
No provision has been made for 2018 tax as the entity is exempt from Income Tax.		

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA
Annual Financial Statements for the year ended 31 December 2018

Notes to the Annual Financial Statements

Figures in Rand

	2018	2017
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6. Auditor's remuneration

Fees	18 285	17 321
Congress audits prior years	7 360	6 817
	25 645	24 138

THE ASSOCIATION FOR MATHEMATICS EDUCATION OF SOUTH AFRICA

Annual Financial Statements for the year ended 31 December 2018

Detailed Income Statement

Figures in Rand	Note(s)	2018	2017
Revenue			
Congress		401 562	484 965
Member fees		416 083	223 921
Sundry income		-	37 038
		817 645	745 924
Other income			
Royalties received		-	18 104
Other income - Math Challenge		-	9 632
Other income		605 506	-
Interest received		60 662	55 915
		666 168	83 651
Operating expenses			
Accounting fees		13 211	8 828
Auditor's remuneration	6	25 645	24 138
Bank charges		34 520	28 839
Congress 2019 Booklet		30 528	-
Council expenses		66 941	-
Employee costs		165 424	179 316
Honorarium and editor fees		-	6 000
IT expenses and web hosting		11 988	18 822
Maths training		285 790	-
National Congress expenses		73 973	95 484
National Council Meeting expenses		30 568	40 475
Postage		113 452	82 164
Printing AMESA news		-	16 530
Printing LTM		108 654	94 124
Printing, stationery and photocopies		32 235	6 065
Profit share due to regions relating to National Congress		146 603	-
Publishing Pythagoras		42 323	111 215
Subscriptions		1 560	3 797
Subsidies refunded to regions		144 228	120 102
Sundry		10 902	-
Telephone and fax		8 057	11 189
Travel reimbursements, flights and accommodation		89 226	63 130
		1 435 828	910 218
Profit (loss) for the year		47 985	(80 643)

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The supplementary information presented does not form part of the annual financial statements and is unaudited

SAMO Awards: (Press release by the South African Mathematics Foundation: September 2019)

Aaron Naidu (Eden College) and **Emmanuel Rassou** (South African College High School) were honoured for their performance in the South African Mathematics Olympiad (SAMO). The 2 learners beat more than 91 000 learners nationwide to be crowned as the overall winners of the South African Mathematics Olympiad (SAMO).

Aaron Naidu, a grade 12 learner from Eden College in Durban won the prestigious Dirk van Rooy gold medal for the senior division of the SAMO. He has been taking part in the South African Mathematics Foundation (SAMF) Olympiad programmes since he was in grade 6. Aside from mathematics he enjoys playing chess, gaming and watching sci-fi and superhero movies and series. Aaron won the junior division of the South African Mathematics Olympiad in 2015 and 2016 and was a top 10 senior medallists in 2017 and 2018. He represented South Africa at the International Mathematical Olympiad (IMO) in 2017 and 2019. In 2017 he obtained an honourable mention and in 2019 he earned a bronze medal.

Emmanuel Rassou won a silver medal at the 2018 SAMO when he was still in primary school. This year he has walked away with the Dawie du Toit gold medal for winning the junior division for the second time in a row. He enjoys athletics and has represented Western Province at hurdles. He was also part of the 2019 South African Pan African Mathematics Olympiad (PAMO) team.

The South African Mathematics Foundation (SAMF) awarded these and other prizes at their annual awards function hosted over the weekend in Gordon's Bay. The first round of the SAMO took place in March with more than 91 000 learners from 1 320 schools participating. A total of 18 858 learners wrote the second round in May and the best 214 learners from the second round qualified for the final round in July.

Other winners were **Kgaogelo Bopape**, who won the award for best performing South African Black learner for the third time in a row. He was also part of the IMO and PAMO team this year. The grade 12 learner from Soweto received a gold medal at the PAMO and earned an honourable mention at the IMO.

Rondebosch Boys' High School in Cape Town came out tops with three awards namely, top performing school in Western Cape, top performing quintile five school and national top performing school.

The Mathematics, Science and Technology (MST) grant is utilised by the provincial education departments to pay the entry fee for learners participating in the SAMO. Sibonokuhle High School in Nseleni, Kwazulu-Natal triumphed as top performing MST school. Samuel Tucker (Pinelands High School in Cape Town) received the best senior MST learner award and Edwin Batsietseng (Vaal Reefs Technical High School in Orkney, North West) was honoured with the best junior MST learner award.

Liberty's Lead Specialist for Corporate Social Investment, Nomaxabiso Matjila is very proud of all the learners. "As the main sponsor of SAMO, Liberty would like to extend its congratulations to the winners. You truly are an inspiration to all learners in the country and are setting a strong example for others to follow. Well done, these achievements are the result of hard work and dedication to your educational journey," she said.

The SAMF programmes such as the SAMO are used to select and train learners for international competitions. Some of the best young mathematicians in the country will be invited to an Olympiad camp in December 2019 hosted by the University of Stellenbosch. From this training squad the South African teams for the PAMO and the IMO will be selected.



Aaron Naidu receiving his prizes at SAMF Awards in September 2019



Emmanuel Rassou receiving his prizes at SAMF Awards in September 2019



Members of the South African Mathematics team for 2019



AMESA Vice-President handing out an award to one of the top Mathematics Olympiad schools for 2019

TOP ESKOM EXPO Learner, Iqra Faki talks to AMESA.

Iqra Faki from Star College, Cape Town, Sybrand Park Campus was the top senior learner in the Mathematics category, as well as overall winner, at the Eskom Expo International Science Fair held at Birchwood, Gauteng in September 2019. Her project, '*Fractal exploration: The 3-dimensional Koch snowflake*', aimed to examine mathematical trends and noticeable properties for the surface area and volume of the three-dimensional Koch snowflake.



Iqra Faki and her project

Vasuthavan Govender (AMESA Executive member) and ESKOM adjudicator asked her a few questions:

1. Tell us something about yourself

My name is Iqra Faki. I am a Grade 12 learner at Star College Cape Town and my passion lies in Mathematics. I tend to find Mathematics rejuvenating and exciting to do. In my eyes, it is essentially a beautiful work of art that gives meaning to everything in science and the universe. My favourite mathematician is Ramanujan because he ultimately showed that having passion and love can get you farther than just educating yourself.

2. What prompted you to do this project?

I stumbled upon fractals upon spending free time researching different aspects and interesting parts of mathematics. From that, I found the infamous Koch Snowflake. In 2018, I found my own way of proving the well-known properties of the Koch Snowflake i.e. an infinite perimeter and finite/fixed area. After doing that project, I desperately wanted to find out how a 3D version of it would behave, which is why I went about doing this investigative project. Therefore, it was essentially curiosity.

3. What did you learn from doing this project?

I discovered that a three-dimensional shape can exist with an infinite perimeter (as in edges) and infinite number of vertices, but at the same time have a finite surface area and volume. By entering expo with this project, I had the opportunity of learning that there are so many amazing young scientists and minds out there and that the future is definitely a bright one because the youth is intelligent, innovative and brilliant.

4. Discuss the support you received from your parents, teachers and others:

Growing up, my parents always exposed me to a lot of mathematics and science and while doing this project, they constantly motivated me and reminded me that I am capable of achieving great things. Naturally, it was not an easy journey and there were times where I contemplated if it was the right decision going along this path, especially during my Grade 12 year. However, my parents did not let me throw all my hard work away and thankfully supported me all the way. My teachers at Star College also gave me immense support from the beginning of my research. Mr Batir, specifically, played a tremendous role throughout the course of my research over the 2 years and I cannot express enough gratitude towards him. He believed in me from day 1 and supervised my project in terms of verifying my self-derived formulas and calculations. All of my friends always gave me loads of support as well by attending the awards ceremonies and constantly reminding me that I am mathematically amazing and special.

5. Any advice you would like to give to South African learners who would like to do something innovative in mathematics?

I only began to enjoy Mathematics in Grade 7 and it was purely because I always entered the class with a positive mind-set. I know many people dislike Mathematics and always brush it off as difficult but once you try to find enjoyment and fun in it, it automatically becomes easy. Therefore, my biggest advice would be to try and grow a liking and interest in Mathematics. This will lead you to want to learn more and eventually lead to finding many discoveries in Mathematics. There is a tremendously large amount of undiscovered work in the field of Mathematics and I strongly believe that many learners out there are able to be the people that discover them.

6. What advice would you give to South African mathematics teachers on the Eskom Expo?

Well, at the end of the day, teachers know learners better than I do but I can definitely recommend involvement in Eskom Expo. I advise mathematics teachers and ultimately all teachers to expose their learners to the scientific method and Eskom Expo from a young age. Learners can enter projects at Eskom Expo from Grade 6 already. Entering constantly definitely refines academic skills to a level beyond the classroom and school curriculum. Therefore, teachers should try their best to expose their learners to Eskom Expo as much as possible.

7. Any other comments?

For anyone else that is eager or interested in working on mathematical research projects, I strongly support and encourage you to do so. However, do not hesitate to seek for support from teachers, friends, family or even the Eskom regional Expo committee, because true success cannot be achieved without having support and encouragement from the people surrounding you as well as having a lot of determination and hard work.

The ASSA South African Mathematics Team Competition (SAMTC): Sponsored by the Actuarial Society of South Africa

Background

The South African Mathematics team competition (previously known as the South African Inter Provincial Mathematics Olympiad or SAIPMO) has been a regular event since 1990. A province, district or region does not coincide with any official nine provinces of the country and neighbouring countries are also welcome to participate. Team must include members from different schools. Each region team enters two teams of ten: Junior (grades 8 and 9) and Senior (grades 10, 11 and 12) (could B, C, ...teams)

Format of the competition

The first part of the Competition kicks off at time to be decided and is a one-hour individual problem paper, consisting of 15 problems in multiple-choice format: 10 questions (6 marks each); 5 questions (8 marks each); wrong solution (0 marks); no solution (1 mark).

After a break for refreshments and a discussion of team strategy, the second part of the Competition takes place. The second paper consists of ten difficult problems; the teams now work together and must submit just one set of answers. (100 marks each)

Results of the 2019 competition

The 2019 competition took place on Saturday 7 September 2019 at centres all over South Africa as well as some Southern African countries. There were 54 teams in the junior section and 48 teams in the senior section.

The junior competition was won by **the Siyanqoba Wits Junior team 1** with an imposing 1907 points (out of 2000 points). The senior competition was won by the **Western Province Senior team 1** with 1483 points (out of 2000 points).



Senior learners working together in the team part of the competition



Junior learners working together in the team part of the competition

AMESA Review of grade 12 papers in 2019

Since 2009, AMESA has been involved in workshop activities which focused on the grade 12 Mathematics & Mathematical Literacy examination papers. These workshop activities take place in the various AMESA regions (provinces). The AMESA National Curriculum Committee then consolidates the input from the regions.

2019 marked the eleventh year in which AMESA has been involved in these workshop activities. Once again, there was keen teacher participation and the feedback from the AMESA regions, regarding these workshop activities, has been very positive. We appreciate the fact that there has been stability in the standard of the papers and there have been attempts to keep the 2019 papers similar to the last two to three years.

Mathematics, Technical Mathematics and Mathematical Literacy were written nationally on Friday 25 October 2019 (paper 1) and Monday 28 October 2019 (paper 2). After these papers were written, Mathematics teachers, under the banner of AMESA, participated in workshops in various AMESA regions. The focus of these workshops was the analyses of these examination papers.

The following key issues were discussed at these workshops and are shown in this report:

Technical aspect; Language used; Syllabus coverage; Standard of the paper; Compliance with levels of thinking (cognitive levels); Comparison to the 2018 paper; Learners views on the papers, Unfair questions and Overall verdict.

The purpose of this report is to provide constructive feedback, on the grade 12 papers, to the Department of Basic Education. We do this in the spirit of promoting mathematics education and enhancing the quality of the teaching and learning of Mathematics in South Africa. It is our hope that the report and the question by question analyses will be useful to the examiners, moderators and markers in our attempt to promote a high standard of mathematics education in our country.

We firmly believe that the DBE, School teachers, Subject Advisors, University Academics; Subject Advisors and others will find the contents of this report thought-provoking and useful.

NB: A full question-by-question analysis appears on the SAMF link below:

https://www.samf.ac.za/content/files/Documents/Final_AMESA_consolidated_grade_12_review_for_2019.pdf

Mathematics Paper 1

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The DBE is to be complimented with the exceptional technical layout of the paper. The diagrams were clear and related well to the information given in a question. However, the overlapping cells in the table in question 11.2 could have been misleading; individual columns would have been less confusing to learners

2. Language used

The language used is very clear and unambiguous; there is no evidence of context that might be bias to any group. However, candidates had to do quite a bit of reading in the various questions of the paper.

3. Syllabus coverage:

Code	Content/Topic	Suggested	Actual
1	Algebra and equations (inequalities)	25 (± 3)	22
2	Patterns and sequences	25 (± 3)	28
3	Finance, growth and decay	15 (± 3)	14
4	Functions and graphs	35 (± 3)	35
5	Differential calculus	35 (± 3)	35
6	Probability	15 (± 3)	16
	TOTAL	150	150

4.1 Standard of paper

The question paper was of a very good standard. There was a high percentage of unpredictable and innovative questions. (Questions 1.1.4; 3 ; 4.7 ; 5.5 ; 6.2.2 ; 7.4 ; 8 ; 9 ; 10.2 and 11.2. In question 3 the Arithmetic Sequence was “nicely” hidden.

Teachers determined that there was a high frequency of level 3 and level 4 questions throughout the paper. In many questions learners had to “unpack” and figure out what the proper context was in order to answer the question, thus raising the difficulty level of the question. If this connection was missed, then there was every likelihood of learners losing marks. While we welcome the introduction of unseen, “different type” questions, we note that these types of questions are challenging for the average and below average learner.

We note that this paper tended to be at a higher than normal level. Top candidates had to be at their exceptional best to achieve 80% and above in the paper.

4.2 Compliance with levels of thinking:

Levels of thinking	Suggested	November 2019
1 – Knowledge	$\pm 20\%$	15%
2 - Routine procedures	$\pm 35\%$	33%
3 - Complex procedures	$\pm 30\%$	33%
4 - Solving problems	$\pm 15\%$	19%

Although the paper is within the prescripts of the CAPS document, it appears to lean towards more level 3 and level 4 questions.

5. Comparison with 2018 paper

To make this comparison, an additional column is added to the above table to show AMESA's levels for the 2018 paper.

Levels of thinking	Suggested	November 2019	November 2018
1 – Knowledge	± 20%	15%	24,7%
2 - Routine procedures	± 35%	33%	33,3%
3 - Complex procedures	± 30%	33%	28,0%
4 - Solving problems	± 15%	19%	14,0%

According to our calculations, the 2019 paper was more challenging than the 2018 paper with more marks allocated to levels 3 and 4. This is probably an attempt to separate the more exceptional and outstanding candidates from the good candidates. However, there were more than enough marks allocated to level 1 and 2 questions (48%) to enable the average learner to pass the paper.

6. Unfair question(s):

As stated earlier, there were a good number of unseen, non-routine, unpredictable questions in the paper but no real stand-alone “unfair” questions. As a collective there were many challenging questions, requiring a good understanding of the mathematical concepts. An example of this was in question 9 where no graph was given.

7. Learners views of the paper

Teachers, involved in the review, reported that their learners wrote right till the end. Most of their learners indicated that the paper was quite “challenging”.

8. Overall verdict

AMESA notes that the NSC Mathematics Paper 1 exams has been becoming more demanding. While this desirable from a tertiary study perspective, the CAPS syllabus tends to be very broad and does not ways allow time to expose the average learner to the depth of understanding required by the examinations. AMESA appreciates that standards are being raised but is concerned that there is no commensurate training of teachers to expose them and, consequently their learners, to these higher standards. This may lead to more learners opting for Mathematics Literacy, something our country cannot afford.

We would now like to give our overall verdict of the paper:

“A creative, but difficult paper with a frequently unusual approach to questions, assessing a deeper understanding of mathematics, and probably favouring the mathematically able learner”

Mathematics Paper 2

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The overall typing and diagrams were the usual high DBE standards. However, the diagram in question 3 was not drawn to scale and created some doubt and unnecessary confusion amongst learners.

2. Language used

The use of language was at an acceptable level for grade 12 mathematics learners. There were no words or terms with which grade 12 learners would not have been familiar with.

3. Syllabus coverage:

Code	Content/Topic	Suggested	Actual
1	Statistics	20 (± 3)	21
2	Analytical Geometry	40 (± 3)	39
3	Trigonometry	40 (± 3)	42
4	Euclidean Geometry and measurement	50 (± 3)	48
	TOTAL	150	150

4.1 Standard of paper

The paper was a very fair paper. The Euclidean Geometry section would have been within reach of most grade 12 mathematics learners. Further, there were enough level 1 and 2 questions for the average and below average learner. Thus, one would expect very little complaints about Mathematics Paper 2.

4.2 Compliance with levels of thinking

Levels of thinking	Suggested	November 2019
1 – Knowledge	$\pm 20\%$	23%
2 - Routine procedures	$\pm 35\%$	34%
3 - Complex procedures	$\pm 30\%$	29%
4 - Solving problems	$\pm 15\%$	14%

The paper is set within the guidelines of the CAPS document.

5. Comparison with 2018 paper

An additional column is added to the previous table to reflect AMESA's 2018 cognitive levels for the Mathematics Paper 2

Levels of thinking	Suggested	November 2019	November 2018
1 – Knowledge	± 20%	23%	20,7%
2 - Routine procedures	± 35%	34%	33,3%
3 - Complex procedures	± 30%	29%	32,7%
4 - Solving problems	± 15%	14%	13,3%

It would appear that the 2019 paper is marginally easier than the November 2018 paper as 57% (as opposed to 54%) of the paper is devoted to level 1 and 2 questions and 43% to level 3 and 4 questions (as opposed to 46%)

6. Unfair question(s):

Question 5.4 combined functions, compound angles and equations. If learners were not able to correctly simplify $f(x)$, then they would not have found the general solution

Question 6.3: Learners would “struggle” to link their knowledge from parabolas to find the value of x for which PQ will be maximum.

7. Learners’ views of the paper

Learners appreciated the fact that the paper was more accessible than paper 1. However, they did find some parts of the paper challenging and most worked right till the end. Some questions were left incomplete. A few learners reported that it would have been better for them to have gone over their theory and put in a “lesser focus on past year papers”.

8. Overall verdict

The paper was comprehensive in nature and had an adequate coverage of the various sections within the prescripts of the CAPS document.

One may, thus, classify the paper as:

“A well-balanced and fair paper, catering for the needs of learners of varying ability levels”

Technical Mathematics Paper 1

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The DBE is to be complimented on the typing and diagrams which are clear and legible. The font size is appropriate and drawings neat. However, the diagram in Question 1.1 may be considered to be irrelevant as it does not add anything to the question

2. Language used

The questions were clear and easy to understand. There were no ambiguous questions. The language would be accessible to most grade 12 Technical Mathematical learners

3. Syllabus coverage

Code	Content/Topic	Suggested	Actual
1	Number System	25 (± 3)	25
2	Algebra	25 (± 3)	24
3	Functions and graphs	35 (± 3)	40
4	Finance, growth and decay	15 (± 3)	17
5	Differential and Integral Calculus	50 (± 3)	44
	TOTAL	150	150

NB: Question 8, although requiring knowledge of the derivative, has been classified as a graph question

4.1 Standard of paper

The paper was of a good standard and should be within reach of grade 12 learners. The mark allocation for the various topics was in line with the prescripts of the CAPS document.

4.2 Compliance with levels of thinking:

Levels of thinking	Suggested	November 2019
1 – Knowledge	$\pm 25\%$	20%
2 - Routine procedures	$\pm 45\%$	59%
3 - Complex procedures	$\pm 20\%$	14%
4 - Solving problems	$\pm 10\%$	7%

5. Comparison to 2018 paper

To compare the paper to the 2018 paper, a column is added to the above table to reflect AMESA's allocation of levels of that paper.

Levels of thinking	Suggested	November 2019	November 2018
1 – Knowledge	$\pm 25\%$	20%	18,7%
2 - Routine procedures	$\pm 45\%$	59%	50,0%
3 - Complex procedures	$\pm 20\%$	14%	22,7%
4 - Solving problems	$\pm 10\%$	7%	8,6%

We note that 79% of the 2019 paper is allocated to level 1 and 2 questions, making it **far easier** than the 2018 paper.

6. Unfair question(s):

There were two optimisation problems, in question 6 and question 8, and these could be regarded as “unfair”, as most learners tend to “struggle” with these types of questions.

7. Overall verdict

One must bear in mind that the type of learner who takes Technical Mathematics in the FET has probably done very poorly up to grade 9 or has moved over from Mathematics during the course of grade 10 or 11.

Notwithstanding these remarks our comment on the paper focuses only on the mathematics and its relevance to grade 12 learners. In this regard we are able to give our verdict as follows:

“A fair and reasonable question paper, appropriate for Technical Mathematics learners”

Technical Mathematics Paper 2

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The DBE is to be complimented for its very clear and legible paper. The font is consistent and all diagrams are well constructed and information presented in an appropriate manner.

There may be an issue with the diagram in 10.2. Although it gave learners detailed explanations on the link between the wheelbarrow and its tyre to the geometric diagram, some learners would have struggled to make this connection.

2. Language used

The language used in the paper should be accessible to most Grade 12 Technical Mathematics learners. There was no ambiguity in any of the questions, which makes questions clear and instructions easy to understand

3. Syllabus coverage::

Code	Content/Topic	Suggested	Actual
1	Euclidean Geometry	40 (± 3)	41
2	Mensuration	15 (± 3)	14
3	Circles, angles and angular movement	20 (± 3)	22
4	Analytical Geometry	25 (± 3)	24
5	Trigonometry	50 (± 3)	49
	TOTAL	150	150

4.1 Standard of paper

The paper covers all the content required for paper 2, according to the CAPS document. It was a good quality paper of a reasonably high standard.

But one must keep in mind that some learners have not passed mathematics since grade 9. There is no doubt that these learners would have struggled with this paper.

4.2 Compliance with levels of thinking:

Levels of thinking	Suggested	November 2019
1 – Knowledge	± 25%	21%
2 - Routine procedures	± 45%	47%
3 - Complex procedures	± 20%	24%
4 - Solving problems	± 10%	8%

The paper appears to be cognitively well balanced.

5. Comparison to 2018 paper

An additional column is added to the above table to show AMESA's cognitive levels for the 2018 paper.

Levels of thinking	Suggested	November 2019	November 2018
1 – Knowledge	± 25%	21%	21,3%
2 - Routine procedures	± 45%	47%	49,3%
3 - Complex procedures	± 20%	24%	21,3%
4 - Solving problems	± 10%	8%	8,0%

Both papers appear to be very similar in a number of ways: cognitive levels, style, content coverage and context. Learners who revised the 2018 paper would have been at a great advantage.

6. Unfair question(s):

The examiners are to be complimented for a very fair paper. There were no unfair questions. However, learner performance would be dependent on the nature of preparation and revision for the paper.

7. Overall verdict

We note the attempts by the examiners to make the 2019 Technical Mathematics Paper 2 more accessible to learners. The paper was well set and had good content coverage. Learners who were well taught and were subjected to some structured revision would have little difficulty in passing the paper.

Our verdict on the paper is:

“A fair, well-balanced, well-thought out paper which should be accessible to most grade 12 Technical Mathematical learners” .

Mathematical Literacy Paper 1

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The paper was technically well set out. All diagrams were neat, and easy to read. There were some issues with the following questions:

Question 2:

2.3.4 There was a discrepancy: Social Development. in the Afrikaans version **but** Community Development in English version

Question 3:

The word square in the text should have been in bold as learners may not easily see this word.

Question 5:

The extract from the pie chart needs to be explained in the text box. Several teachers felt that the excerpt could have been misunderstood by learners. The percentages in the excerpt are confusing and even the teachers had difficulty interpreting probability in this context.

2. Language used

Most learners commented that the questions were easy to read and understand. The examiners are to be complimented on de-cluttering the given information (stimulus) in each question. The language in the paper would be accessible to most grade 12 learners.

3. Syllabus coverage

Code	Content areas (contexts)	Suggested	Actual
1	Finance	53 ± 8	42
2	Measurement	30 ± 8	36
3	Maps, plans and other representations	22 ± 8	22
4	Data Handling	38 ± 8	42
5	Probability	Min 7	8
	TOTAL	150	150

4.1 Standard of paper

It was a paper of a good standard and covered the content areas/contexts reasonably well with a drop in marks for Finance and an increase for Measurement. It would be within the reach of most Mathematical Literacy learners.

4.2 Compliance with levels of thinking

Levels of thinking	Suggested	November 2019
1 – Knowledge	60% (± 5)	56%
2 - Routine procedures	35% (± 5)	39%
3 – Multi-step procedures	5% (minimum)	5%
4 – Reasoning and analysis	0%	-

The allocation of the various levels is in line with the prescripts of the CAPS documents with 95% of the paper devoted to level 1 and level 2 questions.

5. Comparison with 2018 paper

To compare the paper with the 2018 paper, we add a column to the above table to indicate AMESA's allocation of cognitive levels for 2018 paper.

Levels of thinking	Suggested	November 2019	November 2018
1 – Knowledge	60% (± 5)	56%	56%
2 - Routine procedures	35% (± 5)	39%	38%
3 – Multi-step procedures	5% (minimum)	5%	6 %
4 – Reasoning and analysis	0%	-	-

We note that the 2019 paper is virtually the same as the 2018 paper (in terms of levels of thinking). The examiners are to be complimented for its “humanistic” approach to Mathematical Literacy Paper 1.

6. Unfair question(s):

Question 4.2.2 could be regarded as a bit unfair if learners were not taught this section of the work or did not have a geography background.

Question 5.1.3 and 5.1.7 could be considered unfair as very few learners would have been exposed to the way in which it was structured. The percentages in the excerpt tended to be confusing:

5.1.3

Could be seen as

$$100\% - (2,3\% + 1,6\% + 2,9\% + 1,7\%) = 91,5\%$$

$$91,5\% \times 11,2 = 10,25\%$$

5.1.4

The solution to this question would be influenced by the response(s) given to 5.1.3

7. Learners' view of paper:

In a survey of a small sample of 32 learners, 84% indicated that the paper was fair, 81% were happy with the timing and 88% indicated a favourable view of the paper, when compared to the Trial exam Mathematical Literacy Paper 1. If one may extrapolate these views to the wider learner population, there is no doubt that Mathematical Literacy paper 1 would have accessible to the majority of learners.

8. Overall verdict

We note that Mathematical Literacy Paper has historically been classified as a paper which should be accessible to the majority of learners. The 2019 paper is no exception. The content and context coverage, language use and cognitive levels, are in line with what teachers and learners have come to expect from the paper.

Thus, we have no hesitation in declaring the following verdict for the paper:

“A well-balanced fair paper; with clear concise questioning”

Mathematical Literacy Paper 2

A. Overall Review

1. Technical Aspects (typing; diagrams; etc)

The DBE is to be completed on its high technical standards for the paper. The text, diagrams and tables are clear and well set out..

2. Language used

The learners greatly approved of the fact that generally the language was simpler and explanations were shorter than previous years. Participants indicated that learners had to read some questions more than twice to understand what was required, like 1.1.3 , 4.3.1 , 4.2.4. In level 3 and 4 questions it is understandable and acceptable that questions were more complex.

3. Syllabus coverage

Code	Content areas	Suggested	Actual
1	Finance	53 (± 7)	50
2	Measurement	30 (± 7)	24
3	Maps, plans and other representations	23 (± 7)	23
4	Data Handling	37(± 7)	45
5	Probability (minimum)	7	8
	TOTAL	150	150

4.1 Standard of paper

The paper was of a very good standard, in keeping with the Mathematical Literacy Paper 2 questions of the past few year.

4.2 Compliance with levels of thinking

Levels of thinking	Suggested	November 2019
1 – Knowledge	0%	--
2 - Routine procedures	$\pm 25\%$	26%
3 – Multi-step procedures	$\pm 35\%$	37%
4 – Reasoning and reflecting	$\pm 40\%$	37%

We note that the paper is in line with the cognitive levels as prescribed by the CAPS document.

5. Comparison with 2018 paper

We add a column to the above table to show AMESA's allocation of cognitive levels for the 2018 paper:

Levels of thinking	Suggested	November 2019	November 2018
1 – Knowledge	0%	--	0%
2 - Routine procedures	± 25%	26%	28,6%
3 – Multi-step procedures	± 35%	37%	34,7%
4 – Reasoning and reflecting	± 40%	37%	36.7%

The 2019 paper is similar to the 2018 paper, with very slight differences in the allocation of marks for level 2, 3 and 4 questions.

6. Unfair question(s):

There were no unfair questions. Some participants felt that a question like question 4 should have been question 1 and vice versa. All participants were satisfied with the level distribution.

7. Learners' views of the paper

Learners regarded the paper as fair and manageable, but time seemed not to have been enough. Some commented that by the time they got to question 4 they were too tired to put in real effort. Some level 4 questions were regarded as easy level 4 questions.

8. Overall verdict

We note that the paper was within the prescripts of the CAPS document. The paper was relatively accessible in that the challenging questions were not unmanageable. The majority of teachers felt that it was a fair paper in which most learners would be able to pass. However, time was an inhibiting factor for a number of learners. Most teachers felt that the language and explanations of various scenarios in this paper should be the norm for future papers.

We are now in a position to give our verdict on this paper:

“A fair well-balanced paper, typical of the usual style for Mathematical Literacy paper 2”

Pictures from the 2019 Review in Port Elizabeth



Mathematics teachers in action



Mathematical Literacy teachers in action



Mathematical Literacy teachers in action

Obituary

AMESA lost one of its founder and stalwart members, Paul Laridon in June 2019. We look at his contribution to Mathematics Education in South Africa, courtesy of Wits News.

Paul Laridon's remarkable contribution to mathematics education in South Africa was driven through his work at Wits, his involvement in the formulation and revision of school curricula and in his tireless work through professional mathematics associations.



At Wits, Paul first taught undergraduate mathematics courses but his passion for mathematics education was initially fuelled in teaching mathematics methodology courses to pre-service secondary mathematics teachers. Through his tireless efforts, he forged a path and opened a space for mathematics education to be established and ultimately to thrive at Wits. Many of those now working in mathematics education in the University owe a great deal to the pioneering work of this NRF-rated scholar.

In the 1980s he was instrumental in developing an Honours course in mathematics teaching which drew many experienced teachers back into Wits to study more mathematics and mathematics teaching. In the late 1990s and early 2000s he was part of the team that reconceptualised this Honours programme and relaunched it in a new form, attracting many new cohorts of teachers who had previously not had access to postgraduate studies in mathematics education. His many masters and

PhD students benefitted immensely from his breadth of knowledge of mathematics education locally and internationally. He was a member of the team who won the Vice Chancellor's Award for Academic Citizenship in 2003.

In 1990, Paul, together with colleagues Prof John Bradley and Prof Margaret Rutherford, conceptualised and opened the RADMASTE Centre at Wits to promote research and development in maths, science and technology education. Paul led the mathematics work at RADMASTE, impacting the professional and personal lives of many who worked with (never under) him. His influence was widely felt in the former Colleges of Education, in the professional development of teachers studying Further Diplomas in Education, and in the short courses offered to lecturers and teachers in recent years.

Paul's influence on the South African school mathematics curriculum spanned more than 30 years. In the 1980s he offered informal workshops for teachers to help them make sense of the curriculum changes of the day. Post 1994, he played a central role in the conceptualisations of the maths curriculum, from Curriculum 2005 through to the National Curriculum Statement and its revisions. He weathered the storms of curriculum change and critique, navigating the tensions to balance mathematical content and mathematical processes in ways that had potential to open up school mathematics for all.

Paul's work with the professional teachers associations began in the Southern Transvaal Branch of MASA (Mathematics Association of South Africa). After the formation of AMESA (Association for Mathematics Education of South Africa) his immense contribution continued at both regional and national level. He established and chaired the AMESA Curriculum Committee for many years, enabling many in the profession to participate in curriculum debates at local and national level.

Across South Africa, the name *Laridon* is synonymous with the mathematics textbook series *Classroom Mathematics* and thousands of learners will recognise the name from their school mathematics experience. Paul initiated the large team of authors based on his knowledge of groups of mathematicians writing school text books in England. The result was a textbook series that became the national leader for

many years. A co-author notes, “without his dedication and organisation the project would never have got off the ground and many of us would be the poorer without it: both financially and professionally.”

In 2000 Paul became the first honorary member of AMESA. The following tribute, written by AMESA at the time of the award, captures the man and his work:

“His complete and utter dedication to the field of mathematics education from classroom practice to national policy development is an inspiration to those he works with and the AMESA community in particular. Anyone who has worked with or studied under Paul knows that nothing is too much for him. He manages an extraordinary workload, provides unwavering and quality support to all and remains an approachable, generous and humble man.”

Paul Laridon passed away in his sleep on Wednesday 5 June 2019. A former colleague and close friend wisely noted: “he passed away in the same way he lived - at peace with himself”.



MEMBERSHIP

Will members please note that should their postal address change, to **PLEASE** let the Membership Secretary know as soon as possible of the change so that the member can continue getting all the publications that they are entitled to as a paid up member.

Noeline may be contacted at:

Tel : 011 484-8917

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AMESA NATIONAL COUNCIL (2018-2020)

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