# The Grade 9 Maths ANA – What Can We See After Three Years?

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#### INTRODUCTION

The Annual National Assessments (ANA) were introduced to address South Africa's poor performance in international mathematics assessments such as TIMSS and SACMEQ. The Grade 9 test was first written in 2012 with a national average of 12.7%. In 2013 the average increased to 13.9% but then dropped to 10.8% in 2014. The overall picture is one of very poor performance with the result that many questions are being asked about the value and purpose of the ANA.

The Department of Basic Education (DBE) identifies three purposes for the ANAs: (1) a measure for the state to gauge improvement in the education system, based on learner performance year-on-year; (2) a diagnostic assessment to identify areas of weakness in learners' performance; and (3) to provide a model of good assessment practice. While these are all important goals, they are not necessarily achievable through a single instrument. However, this is not the focus of our article. Our purpose here is to report on a content analysis of the three ANA papers which we undertook in the first quarter of 2015, paying particular attention to cognitive demand and levels of difficulty. We share our findings on these aspects, as well as on trends that arise as we look across the first three years of the Grade 9 Maths ANA.

#### CLASSIFICATION OF ITEMS

Classification of items into taxonomies is never a simple matter, and there are no perfect taxonomies. We have attempted to use existing taxonomies with which teachers are familiar but we are not suggesting that these are definitive levels or categories.

#### LEVELS OF COGNITIVE DEMAND

Levels of cognitive demand describe the nature of the item in terms of the mathematical demand. An early Grade 9 ANA document (DBE, 2011) distinguishes three levels: knowledge of basic concepts, application of concepts and non-routine problem solving. However, we chose to work with the four levels of cognitive demand as described in the CAPS document since these are the levels that teachers work with regularly.

- Knowledge requires straight recall, use of mathematical facts, identification and direct use
  of formulae.
- Restive preador well-rehearsed and familiar algorithms, simple calculations that may involve several steps, use of formulae requiring change of subject.
- Complex procidor several calculations that are not all of the same type, complex calculations, route to solution is not entirely obvious, connecting representations, developing proof, requires conceptual understanding.
- Problem solving unseen, non-routine problems, route to solution is not suggested, also requires conceptual understanding.

## **Ana Maths Grade 9**

Aliaa Burqan,Rania Saadeh,Ahmad Qazza,Osama Yusuf Ababneh,Juan C. Cortés,Kai Diethelm,Dia Zeidan

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Il principio di minimo e sue applicazioni alle equazioni funzionali S. Faedo, 2011-06-14 L Nirenberg On ellliptic partial differential equations S Agmon The Lp approach to the Dirichlet problems C B Morrey Jr Multiple integral problems in the calculus of variations and related topics L Bers Uniformizzazione e moduli Theory of Functional Differential Equations Jack K. Hale, 2012-12-06 Since the publication of my lecture notes Functional Differential Equations in the Applied Mathematical Sciences series many new developments have occurred As a consequence it was decided not to make a few corrections and additions for a second edition of those notes but to present a more compre hensive theory. The present work attempts to consolidate those elements of the theory which have stabilized and also to include recent directions of research The following chapters were not discussed in my original notes Chapter 1 is an elementary presentation of linear differential difference equations with constant coefficients of retarded and neutral type Chapter 4 develops the recent theory of dissipative systems Chapter 9 is a new chapter on perturbed systems Chapter 11 is a new presentation incorporating recent results on the existence of periodic solutions of autonomous equations Chapter 12 is devoted entirely to neutral equations Chapter 13 gives an introduction to the global and generic theory. There is also an appendix on the location of the zeros of characteristic polynomials The remainder of the material has been completely revised and updated with the most significant changes occurring in Chapter 3 on the properties of solutions Chapter 5 on stability and Chapter 10on behavior near a periodic orbit Annual Performance Plan Mpumalanga (South Africa). Department of Education, 2015 Frontiers in Number Theory, Physics, and Geometry II Pierre E. Cartier, Bernard Julia, Pierre Moussa, Pierre Vanhove, 2007-07-18 Ten years after a 1989 meeting of number theorists and physicists at the Centre de Physique des Houches a second event focused on the broader interface of number theory geometry and physics This book is the first of two volumes resulting from that meeting Broken into three parts it covers Conformal Field Theories Discrete Groups and Renormalization offering extended Complex Analysis Klas Diederich, 2013-04-17 This versions of the lecture courses and shorter texts on special topics volume contains the Proceedings of the International Workshop Complex Analysis which was held from February 12 16 1990 in Wuppertal Germany in honour of H Grauert one of the most creative mathematicians in Complex Analysis of this century In complete accordance with the width of the work of Grauert the book contains research notes and longer articles of many important mathematicians from all areas of Complex Analysis Altogether there are 49 articles in the volume Some of the main subjects are Cau chy Riemann Equations with estimates q convexity CR structures deformation theory envelopes of holomorphy function algebras complex group actions Hodge theory instantons K hler geometry Lefschetz theorems holomorphic mappings Nevanlinna theory com plex singularities twistor theory uniformization **Old Babylonian** Grammar Michael P. Streck, 2022-08-22 Akkadian written in the cuneiform script is the most important language of the Ancient Near East and one of the most important members of the Semitic language family Old Babylonian is the best attested

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