basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

DIAGNOSTIC TEST ITEMS

GRADE 6 AND 9

MATHEMATICS

AFRIKAANS

QUESTIONS AND MEMORANDA

1. INTRODUCTION

The diagnostic test items aims to improve the relationship between assessment and classroom instruction. Assessment for learning is the process of gathering information about a learner's learning from a variety of sources, using a variety of approaches, or 'assessment tools', and interpreting that evidence to enable both the teacher and the learner to determine where the learner is in his or her learning; where the learner needs to go; and how best to get there. Teachers can adjust instructional strategies, resources, and environments effectively to help all learners achieve grade specific outcomes only if they have accurate and reliable information about what their learners know and are able to do at a given time.

When findings of assessment results are used to improve classroom practice, learner performance in general can improve. The diagnostic assessment tests/questions are designed to fulfill three purposes of assessment: namely to,

- reveal the misconceptions learners bring as prior knowledge to a class;
- measure the conceptual gains of a class as a whole; and
- identify concepts that are weak areas of understanding for the individual learner or as a class/grade.

A traditional multiple choice question (MCQ) provides little information about the learner's understanding of the concept/skill tested. The DBE has embarked on the design of diagnostic assessments using MCQs and assessment rubrics (for Languages) that are designed to assist teachers to diagnose learner misconceptions using the Pearson distractor rationale model as a basis for the classification of learner misconceptions. The diagnosis is also linked to the CAPS learning outcomes and skill acquisition.

MCQs designed for the diagnostic questions included in this package, include a breakdown of learners' understanding through the incorrect responses. All distractors are written not only to focus the attention of the teacher on those learners who are able to identify the correct response, but also to assist the teacher in identifying and understanding the misconceptions captured in the incorrect responses.

2. PURPOSE OF THE DIAGNOSTIC TEST ITEMS

This diagnostic test items should be used in conjunction with the requirements as stipulated in the CAPS document. It therefore does not replace the curriculum or the Annual Teaching Plan (ATP). The content therefore includes coverage from terms one to four. However, teachers may include questions from the resource bank into the ATP to facilitate assessment for learning.

These diagnostic assessments/questions are a phase based assessment. It also includes questions from four grades. There are questions set on the critical skills

from the two earlier grades, the current grade and the next grade. The selection of questions from the four grades was done by looking at those concepts that were taught in the two earlier grades and were then extended in the next two grades as well. This would enable the teacher to identify at which specific grade the knowledge gap is.

The assessment guidelines per subject and grade have a detailed explanation of the topics/skills that are in this category. The spread of questions in the composite assessment is weighted to facilitate a phase based assessment and is broken down into the four composite grades as illustrated below:

Table 1: Percentage spread of questions (Languages and Mathematics)

	Spread of Questions			
Weighting	±10%	±20%	±60%	±10%
Grade 6	4	5	6	7
Grade 9	7	8	9	10

The purpose of including the content of the other grades is to diagnose the skill/concept acquisition at the earlier grade, the current grade as well as to ascertain whether the learner is ready to make the transition to the next grade. Once the teacher has identified the gaps in the conceptual knowledge/ skill acquisition it would be easier to design targeted intervention programmes to bring learners on par for the transition to subsequent grades/topics.

These diagnostic questions should be used as a tool for teachers to assess the strengths and weaknesses of learners for the purpose of designing teaching and learning strategies that will address the individual needs of the learner.

This assessment should not be used for grading a learner; as the intended purpose is to facilitate learning.

3. THE STRUCTURE OF THE DIAGNOSTIC TEST ITEMS

The diagnostic test items is divided into sections or questions. Questions are framed to direct teachers to possible misconceptions which could be as a result of an earlier grade knowledge deficit, erroneous conceptual knowledge or lack of comprehension. Each paper has a spread of the content areas and skills that span the entire phase and is extended into the next phase. The texts/topics that have been selected for the Languages questions indicate the concept/skill progression from one grade to the next. The Mathematics questions are clustered according to content areas.

MCQs are constructed in such a way that each distractor provides information on whether the learner has mastered the skill/concept or whether there is a misconception. The distractors are graded according to four levels of understanding. Levels one, two and three enlighten the teacher about the nature of the misconception. Level four is the correct response, see Table 3 for further clarity.

Short questions are constructed to assess writing skills, mental computations, knowledge recall and application of rules or theorems.

Longer responses are constructed so that thought process, writing skills and consolidation and application of content areas and concepts across the subject are consolidated to arrive at the intended response.

Mathematics

4. PROPOSED USAGE OF THE MATHEMATICS DIAGNOSTIC TEST ITEMS

4.1 Parts of the paper may be used independently at different intervals i.e. as a revision activity, formative task, etc.

4.2 Certain questions **per topic** or skill assessed may be selected from each section to compile a shorter testlet.

EXAMPLES

Grade 6: Common fractions	**Grade 9: Algebraic expressions**
Section A question 6 Section C question 3 & 6	Section A question 20, 21, 25 - 31 Section B question 13 -17 Section C question 3 - 4

4.3 Questions may be selected according to **levels of difficulty** and can be used to support learning according to different cognitive demands or be used to support progressed learners. E.g. Levels of difficulty (easy, moderate & difficult)

Table 2: Levels of difficulty using the Bloom's taxonomy

EXAMPLES

Grade 6 (moderate questions)	**Grade 9 (easy questions)**
Section A	**Section A**
Question 4 – 9, 11–14, 17, 19 – 22, 25 – 27 & 29	Question 1 – 3, 6 – 8, 10, 13, 17, 20, 21, 23, 25, 26, 34, 35, 40 – 43, 45 & 48
Section B	**Section B**
Question 3, 5, 7, 9, 10, 12, 14, 19 – 22 & 24	Question 1 – 6, 9, 10, 13 – 16, 18, 20, 21, 23 – 26 & 28 – 30
Section C	**Section C**
Question 1 – 4 and 7	Question 3, 7, 8, 14 & 15

4.4 Questions may also be used as a **baseline** assessment if administered prior to teaching a particular lesson. A teacher may want to establish whether learners meet the basic skills and knowledge acquired from the lower grades. This will assist the teacher to know learners' level of proficiency. A sample of questions for each grade is as follows:

Level of difficulty	**Blooms Taxonomy**	**Descriptors** (These are not limited to the ones listed below)
Easy	Remembering and Understanding	Complete, list, name, identify; recall, repeat, state, classify, re-group/group, rearrange/arrange, collect, categorise, select, recognize, supply, separate, isolate, draw etc.
Moderate	Application and Analysis	Predict, infer, interpret, understand, rewrite in a certain order, apply, demonstrate, illustrate, investigate, factorise, differentiate, similarities, solve etc.
Difficult	Evaluating and Creating	Analyse, evaluate, justify, provide a reason, criticize, judge, derive, combine, construct, synthesise; proof; etc.

Grade 6 Baseline questions (whole numbers)

Grade 4	Grade 5
Section A Question 12 **Section B** Question 1	**Section A** Question 2 & 5 **Section B** Question 2 & 6 **Section C** Question 2

Grade 9 Baseline questions (fractions)

Grade 7	Grade 8
Section A Question 1 & 10 **Section B** Question 1	**Section A** Question 4 & 8

4.5 Diagnostic questions can also be selected according to **cognitive levels**. A sample of questions for each grade is as follows:

Cognitive levels	Grade 6	Grade 9
Knowledge	**Section A** Question 12, **Section B** Question 7	**Section A** Question 2, **Section B** Question 1, **Section C** Question 8
Routine Procedure	**Section A** Question 15, **Section B** Question 21, **Section C** Question 5	**Section A** Question 3, **Section B** Question 7, **Section C** Question 11

Complex Procedure	**Section C** question 7	**Section A** Question 12, **Section B** Question 17, **Section C** Question 9
Problem Solving	**Section A** question 27, **Section B** question 11	**Section A** Question 50, **Section C** Question 10

4.6 The teacher should decide when, where and how the assessment may be used to enhance teaching and learning.

4.7 The questions may be used at the beginning of a phase to establish whether learners meet the conceptual knowledge for the new grade/phase.

5. DESIGN

The table below lists and describes the types of errors that correspond to each of the four levels of understanding encapsulated in the Mathematics MCQs. The distractor rationale as advocated by Pearson, 2004, forms the basis for diagnosing misconceptions. The taxonomies and cognitive levels as stipulated in CAPS (for Grades 4-9) are incorporated into the levels of understandings to provide the teacher with holistic information about the level of performance. The cognitive levels are now introduced in the Foundation Phase CAPS.

A more detailed unpacking of the nature of the misconceptions is addressed in the marking guidelines of each diagnostic question.

Table 3: Levels of understanding (thought process)

Levels of understanding	**Descriptors for the levels of understanding. There is:**
Level 1	Learners demonstrate (i.e. a combination but may not be all of the following) that they: - have no understanding of the question or a conceptual misunderstanding; - are unfamiliar with operational procedures but can compute basic straight forward operations; - are not able to implement (un)related strategies to solve a problem;

Levels of understanding	Descriptors for the levels of understanding. There is:
	- excessive depend on the information that is provided in the question and is incorrectly used/duplicated; - utilise unrelated vocabulary to the question. - Etc.
Level 2	Learners demonstrate (i.e. a combination but may not be all of the following) that they: - can apply some computational ability that may not necessarily relate to the question or that demonstrate inadequate conceptual knowledge and flawed reasoning to support conclusions/inferences; - can apply basic mathematical knowledge in straight forward situations; - demonstrate a limited knowledge of some concepts and some procedures; - Etc.
Level 3	Learners demonstrate (i.e. a combination but may not be all of the following) that they can: - apply some conceptual knowledge and ability to analyse but is inconsistent in computational and reasoning skills; - apply their knowledge and understanding to solve problems. - solve word problems involving operations with whole numbers and use division in a variety of problem solving situations. - interpret and use data to solve problems with minimal error of judgement; - use given information to complete various graphs; - Etc.
Level 4	Correct response.

Levels of understanding	Descriptors for the levels of understanding. There is:
	Learners demonstrate (i.e. a combination but may not be all of the following) that they: - consistently apply/demonstrate correct computational and reasoning skills required in the question; - apply their understanding and knowledge in a variety of relatively complex situations and explain their reasoning; - solve a variety of multi-step word problems; - apply geometric knowledge of a range of two-and three-dimensional shapes in a variety of situations; - draw a conclusion from given data and justify their conclusion. - Etc.

Each level of understanding is captured in the distractors of all the multiple-choice questions. A question will include distractors that correspond to each level of understanding set out in the table above.

When learner responses are analysed the diagnostic distractors will reveal patterns in a learner's understanding of the content being tested. The teacher is thus guided towards instruction that specifically addresses a learner's understanding of a concept in the specific content.

6. MARKING GUIDELINES: MATHEMATICS

6.1 Multiple Choice Questions (MCQs): Marks are allocated according to the cognitive demand of the question. However, the focus of these assessments is not on scoring the learner, but rather on what the learner is able to do or not do.

6.2 Section A and B are allocated a mark each per answer. Marks for Section C are allocated according to the demand of the question.

6.3 The marking guideline has columns indicating the number for each question, the expected answer per question, the level of understanding/error analysis (for Section A), the cognitive level, the level of difficulty, the grade level at which a question and its answer are pitched. The mark allocation is merely a guide for the learner's response and should not be the focus of the task.

6.4 The levels of difficulty indicate the cognitive demands of the question which are: Easy (E), Moderate (M) and difficult (D).

6.5 The Cognitive levels are as prescribed in the CAPS for the Intermediate and Senior Phases and will now be introduced in the Foundation Phase. The cognitive levels, their descriptors and examples are indicated in Table 5.

Table 4: Example of the Marking Guideline (for Mathematics)

No.		Expected answer	Level of understanding/Error analysis		Cognitive level	Level of difficulty	Grade
1.	A	$\frac{8}{18}$	1	Added numerators and denominators together.	R	E	7
	B	$\frac{37}{40}$	4	Correct response: $\frac{3}{10}\times\frac{4}{4}+\frac{5}{8}\times\frac{4}{4}=\frac{12}{40}+\frac{25}{40}=\frac{37}{40}$			
	C	$\frac{8}{40}$	2	Correct LCM but added numerators.			
	D	$\frac{15}{80}$	2	Multiplied 3 by 5 and 10 by 8			

In cases where learners are required to display multiple steps/procedures in order to solve a problem, apply the following techniques when marking:

a. Where there is clear evidence of a misread/misinterpretation, a penalty of 1 mark is generally appropriate. A learner should not be penalised for the same error throughout the assessment.
b. If a learner has knowledge of the method but could not get the final correct answer, award a **method** (M) mark but not an **accuracy** (A) mark. If the method is incorrect but the answer is correct, award a mark for the answer only.
c. Consistent Accuracy mark is applied when an answer is correctly followed through from an incorrect previous answer.
   E.g. Grade 3 question
   1. What is the number that is 5 more than 20?
      1.1 Write the **number symbol** for the number.
      1.2 Write the **number name** for the same number you wrote in 1.1 above.

   Learner response

      1.1 **205** (the answer is incorrect)
      1.2 **Two hundred and five**. (The number name is correct according to the number symbol provided by the learner in number 1.1 even though it

was not the expected answer.)

In this instance do not award a mark for the 1st answer but award a mark for the 2nd answer because it was correctly followed through from an incorrect answer. This is how to apply **consistent accuracy** (CA) marking.

Table 5: MATHEMATICS COGNITIVE LEVELS

LEVEL 1:	LEVEL 2:	LEVEL 3:	LEVEL 4:
KNOWLEDGE (K)	**ROUTINE PROCEDURES (R)**	**COMPLEX PROCEDURES (C)**	**PROBLEM-SOLVING (P)**
• **Knowing** • **Remember/Recall**	• **Applying routine procedures in familiar contexts** • **Understanding**	• **Applying multi-step procedures in a variety of contexts (including word sums)**	• **Reasoning and reflecting**
• Straight recall • Identification of correct formula • Know and use formulae such as the area of a rectangle, a triangle and a circle where each of the required dimensions is readily available. • Read information directly from a table (e.g. the time that bus number 1 234 departs • Use of mathematical facts • Appropriate use of mathematical vocabulary • Know appropriate vocabulary such as equation, formula, bar graph, pie chart, Cartesian plane, table of values, mean, median and mode. • Write the next three numbers in the sequence: 103; 105; 107…	• Perform well-known procedures. • Learners know what procedure is required from the way the problem is posed. • Simple applications and calculations using the basic operations including: o algorithms for +, -, ×, and ÷ o calculating a percentage of a given amount • Calculations which might involve many steps • Derivation from given information may be involved • All of the information required to solve the problem is immediately available to the student and where each of the required dimensions is readily available.	• Problems involving complex calculations and/or higher order reasoning • The required procedure is not immediately obvious from the way the problem is posed. • Learners will have to decide on the most appropriate procedure to solve the solution to the question and may have to perform one or more preliminary calculations before determining a solution. • Investigations to describe rules and relationships – • There is often not an obvious route to the solution • Problems not based on a real world context - could involve making significant connections between different representations	• Unseen, non-routine problems (which are not necessarily difficult) • Higher order understanding and processes are often involved • Might require the ability to break the problem down into its constituent parts • Generalise patterns observed in situations, • Make predictions based on these patterns and/or other evidence and determine conditions that will lead to desired outcomes. • Pose and answer questions about what mathematics they require to solve a problem and then to select and use that mathematical content. • The sum of three consecutive whole numbers is 27. Find the numbers. • Sarah divided a certain number by 16. She found an answer of 246 with a remainder of 4. What is the number?

• Determine the factors of 64 • Write the prime numbers that are factors of 36	• Estimation and appropriate rounding off of numbers • Measure dimensions such as length, weight and time using appropriate measuring instruments sensitive to levels of accuracy. • Draw data graphs from provided data. • Solve equations by means of trial and improvement or algebraic processes • Determine the value for if x + 4 = 10. • Use three different techniques of calculating 488 + 16 • Calculate: 115 + 31 012.	• Conceptual understanding • One or more preliminary calculations and/or higher order reasoning • Solve equations by means of trial and improvement or algebraic processes • Select the most appropriate data from options in a table of values to solve a problem. • Decide on the best way to represent data to create a particular impression. • Betty is 4 years old and Jabu is 8 years old. Determine the ratio between their ages. Write the ratio in simplest fractional form. • Investigate the properties rectangles and squares to identify similarities and differences. • There were 20 sweets in the packet. William and his friend ate $\frac{2}{5}$ of the sweets. How many sweets are left	• Busi has a bag containing three coloured balls: 1 blue, 2 red ball and 3 yellow balls. She puts her hand in the bag and draws a ball. What is the chance that she will draw a red ball? • Write the answer in simplest fractional form.

7. MODERATION

Internal moderation is important in assuring that the marking criteria/guideline is consistently applied, and that there is a shared understanding of the academic standards learners are expected to achieve. There should be processes in place for assuring comparability of marks for alternative assessments. Schools may therefore determine the format for moderation as a standardisation and quality-assurance measure.

8. DATA ANALYSIS AND UTILISATION

The teacher would be able to collect data on an individual learner, a class, a grade or for the entire grade and report at each level. Further data can be collected per topic/skill/content area. The teacher is also able to use the phase test and identify at which grade the knowledge deficit is. Since this is an exercise in assessment for learning targeted interventions can be designed to address strengths and weaknesses. Teachers would be able to give feedback to parents on learning gaps, deficits and strengths per learner.

8.1 Purpose of the data analysis

After administering a test the teacher can do own diagnostic analysis to identify:-

a) The overall level of performance of the class or school;
b) Individual learners or schools that need special intervention;
c) Groups of learners or schools who need special support and
d) Subject content areas that require priority attention in teaching and learning.

8.2 Use of basic statistics for analysis

Basic statistics that can be used to summarize the data from a test include the following:-

i. **Mean** (often called average) – calculated by adding the scores of all the learners and dividing the sum by the number of learners. The mean is one score that is used to summarize all the scores obtained by learners in a test. A high mean score represents high performance and a low mean score represents low performance. However, the mean score does not indicate how learner scores are spread from the highest to the lowest and thus is not adequate for identifying individuals who either over-perform or under-perform.

ii. **Median** (or middle score) – calculated by first arranging the scores from the highest to the lowest and then determining the score that divides the data into two equal halves. Half of the learners who wrote a test will have

scores above the median score and the other half will have scores below the median score. If the number of learners is an odd number the median will be a real score that sits half-way between the extreme scores, e.g. 76, 57, 49, 45 and 39 have 49 as the median score. However, if the number of learners is an even number the median will be a score that may not belong to any of the learners calculated by adding the two adjacent scores that are half-way between the extremes and dividing their sum by two (2), e.g. the median of 76, 57, 49 and 45 is calculated by adding 57 and 49 and dividing the sum by two, i.e. (57 + 49)/2 = 106/2 = 52. As can be observed, 52 is not one of the four given scores but it is the median score that sits half-way between the extreme scores, viz. 76 and 45.
The median does not show what the extreme scores, i.e. the highest and the lowest scores, are.

iii. **Maximum** is the highest score obtained by a learner in a test.
iv. **Minimum** is the lowest score obtained by a learner in a test.
v. **Range** is the difference between the **Maximum** and the **Minimum** scores. The larger the range, the more diverse the ability levels of the test takers while a relatively small range indicates that the class of test takers has a relatively homogeneous ability profile.

8.3 Available tools for data analysis

Tools that are available for analysis of data include pre-programmed computer software such as the SA-SAMS in schools, the Microsoft Excel programme and even hand calculators. The Microsoft Excel programme, which comes with almost every computer software, is a reasonably easy-to-use tool for performing item-level diagnostic analysis of test data. An Excel spreadsheet is arranged in columns and rows.

8.4 Preparing data for analysis on Excel

Excel makes available useful formulae to calculate basic statistics. To prepare for analysis of data from an administered test, do the following:-

i. Mark the test and write the scores obtained by each learner next to the relevant question/item number in their books or scripts;
ii. Enter learner names and other particulars (e.g. the gender of each learner) in the rows, one after another;
iii. Enter test item numbers in the columns, one after another;
iv. Enter the score of each learner on each item in the correct cell (i.e. where the relevant column and row meet);
v. Check if all data has been entered correctly (i.e. do thorough data

cleaning);

vi. Use correct formulae to calculate the statistics that you want to use to summarize and analyse the test data; and

vii. Interpret the statistics in terms of what they suggest about performance of individuals in your class, performance of identifiable groups of learners (e.g. boys and girls) and performance in specific content areas.

8.5 Analysis and interpretation

To summarise the data calculate the average percentage score, the median, maximum and minimum score percentages and you may do this separately for boys and girls. To make sense of the analysis it is recommended that different colour codes be used to mark specific observations (Excel provides a wide range of colour codes) and also represent findings with appropriate graphs to enhance visual impressions to aid decision-making on where to focus improvement interventions. For instance, the following observations can be made from the analysis that has been done:

a) Overall performance

Overall performance in this class, measured through the mean score, may be e.g. 54,4% which is relatively acceptable but still leaves room for improvement. The median score for the class may be 56% which means that half of the learners obtained scores above 56% and another half obtained scores below 56%.

b) Performance spread

Although the mean and median scores were both above 50%, learner scores may range between eight percent (8%) and 100% which is a fairly wide range that suggests diverse abilities in this class. This implies that intervention strategies will have to be diversified in order to meet the learning needs of different learners, i.e. a one-size-fits-all improvement strategy will not work in this class.

c) Individual learner differences in performance

Individual learners who were identified to be particularly at risk have been indicated with e.g. red colour coding. They obtained scores below 40% and thus fall within the “Not achieved” and “Elementary achievement” levels. They require special attention in terms of teaching strategies and learning opportunities.

d) Group differences in performance

Analysis was done at two group levels, viz. boys and girls. All the summary statistics indicate that the boys performed much lower than the girls. Their mean score was 49,3% against the 60% mean score obtained by girls. The median score for the boys was four percent (4%) lower than of the girls, viz. 52% as against 56%. Boys' scores ranged between eight percent (8%) and 88% while the lowest score for the girls was 32% and the highest was 100%. It is evident that in this class boys require a different or more focused intervention than the girls.

e) Performance in specific topics or skills

The percentage scores per item indicate the items and, therefore, the topic or skill where interventions must focus. The analysis and diagnosis (from 'a' to 'e' above) identifies:-

i. Which learners need special attention?; and
ii. Which content areas require special focus?
The analysis also suggests what materials will be required to improve on the identified areas, what extra support the teacher will need (if necessary), whether additional time will be required, who else should be involved in the interventions and a host of other possibilities that the data analyser may see fit in their context.

8.6 Error analysis

Error analysis is the study of errors in learners' responses with a view to look for possible explanations for these errors. It provides specific information about the relative skill proficiency or misconception a learner has in his/her response, in order to understand what the learner can or cannot do. It is a multifaceted activity, for the teacher, because it involves analysis of the correct, partially correct and incorrect thought processes of the learners' individual responses and thinking about possible remediating interventions that might work well.

Understanding the errors a learner or a group of learners make will determine how learners are grouped in a certain subject. to enhance effective teac

REFERENCES

1. Kelly V. King et al (2004), *The Distractor Rationale Taxonomy: Enhancing Multiple Choice Questions in Reading and Mathematics,* Pearson Education
2. The Cardiff University Assessment Strategy (http://www.cf.ac.uk/learning/themes/assess/strategy/index.htm

GRADE 6 MATHEMATICS AFRIKAANS

DIAGNOSTICS QUESTIONS & MEMO

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

DIAGNOSTIESE HULPBRONNE BANK

WISKUNDE: AFRIKAANS

GRAAD 6

Nota aan die onderwyser/es:

1. Hierdie “toetse” is ontwerp as ‘n diagnostiese assesseringsinstrument .
2. Bestudeer asseblief die onderwys riglyne voordat jy die toets administreer/vrae selekteer.
3. Administreer die vrae volgens die afdelings/moeilikheids/onerwerpe/inhouds areas/kognitiewe vlakke/graad(e).
4. Verder mag jy die vrae van die verskillende afdelings/leerarea inhoud/moeilikheids graad/kognitiewe vlakke of graad(e) afbreek.
5. Die seleksie van die afdelings sal afhang van die doel van die assessering. Bv.
    - Indien jy wil vasstel of die Graad 6 leerder in jou klas bevoeg is in sekere Graad 4 en 5 temas. Dus sal jy al die Graad 4 en 5 items vanuit die gekose inhouds areas uit die verskillende afdelings kies.
    - Hierdie mag as ‘n basis assessering aan die begin van die jaar ge administreer word.
    - Jy kan dan jou lesse vir jou Graad 6 leerders beplan, gebasseer op jou diagnostiese analise van jou basis assessering.
    - Jy kan op dieselfde wyse vrae volgens die verskillende temas in die NKBV selekteer volgens die doel van jou assessering.

Let asseblief op na die volgende sleutels:

	Inhouds Area	**Moeilikheids graad**	**Kognitiewe vlakke**
GBV	Getalle, Bewerkings en Verwantskappe	**M:** maklik	**K:** kennis
PFA	Patrone, Funksies en Algebra	**G:** gemiddeld	**R:** roetine prosedure
RV	Ruimte en Vorm (Meetkunde)	**Mo:** moeilik	**KB:** komplekse bewerkings
M	Meting		**P:** probleem oplossing
DH	Data Hantering		
G (6)	Graad 6		

Let asseblief daarop dat die sleutel bo aan elke vraag, soos hieronder, die volgende inligting in hierdie volgorde verskaf: inhoudsarea,tema,graad vlak van die vraag,kognitiewe vlak, moeilikheids graad bv.:

Inhoudsarea	Tema	Graad 4	Kognitiewe vlak	Moeilikheids graad
GBV	Gewone breuke	G4	R	M

Dit is dus in die volgende formaat: **GBV/gewone breuke/G4/R/M** bo aan elke vraag geskryf.

AFDELING A

Omkring die letter van die korrekte antwoord van vraag 1 tot vraag 30.

GBV/ Plekwaarde/ G4/K/M

1. Skryf die getal wat gelyk is aan

   6 ene + 2 tiene + 7 honderde + 5 duisende.

   A 7 562
   B 6 275
   C 5 726
   D 2 756

(1)

GBV/Getalpatrone/G5/K/R

2. Watter getal in die getalpatroon is VERKEERD?

   7; 9; 12; 16; 21; 28

   A 28
   B 21
   C 16
   D 12

(1)

GBV/Place Plekwaarde/G5/K/M

3. Wat is die waarde van die onderstreepte syfer in 29 0<u>7</u>2?

   A 7 duisend
   B 7 honderd
   C 7 ene
   D 7 tiene

(1)

GBV/Heelgetalle/G6/K/G

4. Watter een van die volgende getalle is groter as 765 000 000?

   A 766 000 000
   B 765 000 000
   C 756 000 000
   D 764 000 000

(1)

GBV/Afronding/G5/R/G

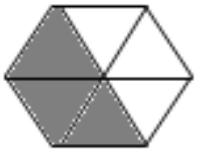
5. Is 39 569 afgerond tot die naaste 5, 10,100 of 1000 om ‘n antwoord van 40 000 te gee?

A 1 000
B 100
C 10
D 5

(1)

GBV/Gewone Breuke/G6/K/G

6. Watter breukdeel van die 2-D vorm is ingekleur?



A $\frac{3}{3}$
B $\frac{6}{3}$
C $\frac{1}{2}$
D $\frac{2}{1}$

(1)

GBV/ Verhoudings/G6/R/G

7. Wat is die verhouding tussen die aantal swart balle tot die aantal wit balle?

A 4:8
B 2:1
C 4:1
D 1:2

(1)

GBV/Bewerkings/G6/R/G

8. Watter getalsin hieronder het dieselfde waarde as 5 × (6 + 2)?

A (5 × 6) + 2
B (5 × 2) + 6
C (6 + 2) × 5
D (5 + 2) × 6 (1)

GBV/Woordsomme/G6/R/G

9. Daar is 5 bokse, elkeen bevat 125 appels. Hoeveel appels is daar in totaal?

A 600
B 625
C 130
D 25 (1)

GBV/Woordsomme/G6/P/Mo

10. Faiza maak ‘n boek oop. Sy vermenigvuldig die twee opeenvolgende bladsynommers en kry 1 332. Wat is die bladsynommer aan die linkerkant?

A 666
B 667
C 36
D 37 (1)

GBV/Woordsomme/G6/P/G

11. Tozi spaar R440. Charlene spaar dubbeld die bedrag. Charlene spandeer dan R100. Hoeveel het Charlene nou oor? Kies die getalsin wat jou kan help om die antwoord te vind.

A 440 + 440 – 100
B 440 + 440 + 100
C 440 + 100
D 440 – 100 (1)

GBV/ Veelvoude/G4/K/G

12. Watter een van die onderstaande getalpatrone bevat veelvoude van 6?

A 1; 2; 3; 4; 5; 6
B 6; 12; 18; 24
C 6; 9; 12;15
D 1; 2; 3; 6 (1)

GBV/ Bewerkings/G6/R/G

13. Watter bewerkingsteken moet die* vervang om die getalsin waar te maak?

8 × 7 = 67 * 11

A ×
B –
C ÷
D + (1)

GBV/Verhoudings/G7/R/G

14. Voltooi: Die eenvoudigste vorm om die verhouding 9:39 te skryf is …

A 3:13
B 3:12
C 1: 4
D 1: 6 (1)

GBV/Faktore/G7/R/Mo

15. Watter een van die volgende is die produk van die priemfaktore van 32?

A 2 x 2 x 3 x 3
B 3 x 3 x 4
C 2 x 2 x 9
D 2 x 3 x 6 (1)

PFA/Getalpatrone/G6/R/M

16. Watter reël sal die onderstaande getalpatroon die beste beskryf?

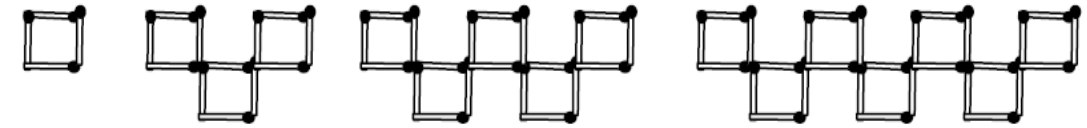
2 525; 2 550; 2 600; 2 625; 2 675; 2 700; _.

A Tel 50 en dan 25 by
B Tel 25 en dan 50 by
C Tel 50 by
D Tel 25 by (1)

PFA/Geometriese Patrone/G6/R/G

17. Jani bou vorms met vuurhoutjies.

Hoeveel vuurhoutjies sal sy gebruik om die vorm in die 20ste posisie te bou indien die patroon sou aanhou?



Vorm 1 Vorm 2 Vorm 3 Vorm 4

A 160
B 164
C 158
D 156 (1)

RV/Simmetrie/G5/K/G

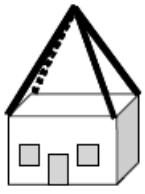
18. Hoeveel lyne van simmetrie het die onderstaande reghoek?

A 6
B 4
C 2
D 1 (1)

RV/3–D Voorwerpe/G6/K/G

19. Kyk na die onderstaande prentjie van die huis.

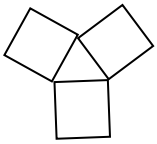
Watter vorm beskryf die vorm van die dak?

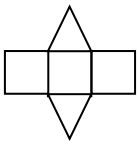


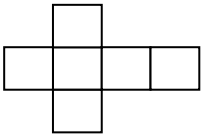
A ‘n Piramide met ‘n reghoekige basis
B ‘n Reghoekige prisma
C ‘n Silinder
D ‘n Keël (1)

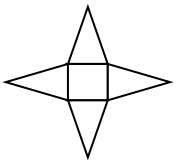
RV/3–D Voorwerpe/G6/K/G

20. Watter een van die volgende is die net van ‘n piramide met ‘n vierkantige basis?

A 

B 

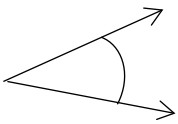
C 

D 

(1)

RV/Hoeke/G6/K/G

21. Identifiseer die tipe hoek wat hier onder getoon word. Dit is …

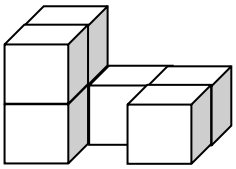


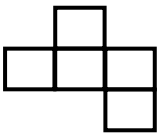
A ‘n stomphoek.
B ‘n skerphoek.
C ‘n regte hoek.
D ‘n inspringende hoek .

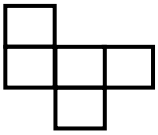
(1)

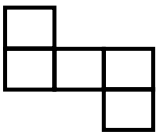
RV/Aansigte/G6/K/G

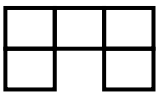
22. Watter een van die volgende diagramme wys die bo- aansig van die gegewe 3-D voorwerp?



A 

B 

C 

D  (1)

M/Tyd/G4/R/M

23. Dix wil ‘n film kyk wat tussen $1\frac{1}{2}$ en 2 ure lank is. Watter een van die volgende films moet sy kies? ‘n …

A 102 - minute film
B 121 - minute film
C 150 - minute film
D 59 - minute film (1)

M/Kapasiteit/G5/R/M

24. ‘n Glas het die kapasiteit van 250 milliliter. Hoeveel glase kan gevul word uit 1 liter koeldrank?

A 25 glase
B 10 glase
C 4 glase
D 1 glas (1)

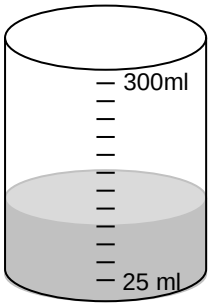
M/Tyd/G6/R/G

25. Hoeveel dekades is daar in 2 150 jare?

A 21 500
B 2 150
C 21,5
D 215 (1)

M/Kapasiteit/G6/R/G

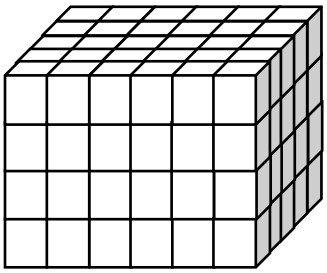
26. Hoeveel water is in die gegewe figuur getoon?



A 250 mℓ
B 100 mℓ
C 300mℓ
D 275mℓ (1)

M/Volume/G6/R/G

27. Hoeveel kubusse is gebruik om die onderstaande 3-D voorwerp te bou



A 120 kubusse
B 24 kubusse
C 60 kubusse
D 30 kubusse (1)

DH/Modus/G5/K/M

28. Wat is die modus van die volgende datastel?

4 4 5 5 5 6 6 7 7 7 7 7 8

A 5
B 6
C 7
D 8 (1)

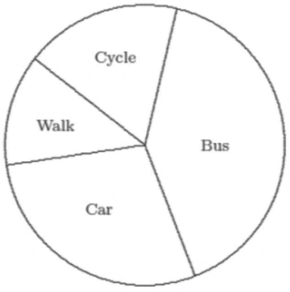
DH/Mediaan/G6/K/G

29. Wat is die mediaan van die volgende massas?
39 kg 40 kg 42 kg 45 kg 46 kg 50 kg 60 kg

A 46 kg
B 60 kg
C 45 kg
D 39 kg (1)

DH/Interpretasie/G6/P/Mo

30. Die onderstaande sirkelgrafiek wys hoe die leerlinge in ‘n klas na skool reis. Watter een van die onderstaande stellings is waar?



A Meer as die helfde van die leerlinge ry met die bus of ry fiets.

B Meer as ‘n kwart van die leerlinge loop skool toe.

C Meer as die helfde van die leerlinge loop of ry fiets skool toe.

D Meer leerlinge loop skool toe as wat daar per kar ry . (1)

AFDELING B

GBV/Afronding/G4/R/M

1. Voltooi: 1 369 afgerond tot die naaste 10 is … (1)

GBV/Bewerkings/G5/K/M

2. Voltooi:
2 x (3 x 4) = (2 x 3) x (___) (1)

GBV/Bewerkings/G6/R/G

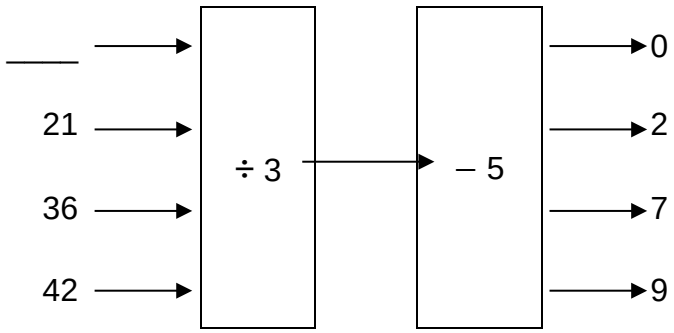
3. Wat is die waarde van (6250 ÷ 125) × 0 + 14? (1)

GBV/Bewerkings/G6/R/Mo

4. Sit hakies in om die volgende stelling waar te maak.
4 + 3 x 7 – 10 = 39 (1)

GBV/Vloeidiagramme/G6/R/G

5. Voltooi die vloeidiagram deur die ontbrekende getal in te vul. (1)



GBV/ Heelgetalle/G5/K/M

6. Skryf die grootste getal wat gemaak kan word deur elk van die syfers5, 9, 6, 1, 7, 2 slegs een maal te gebruik. (1)

GBV/Bewerkings/G6/K/G

7. Voltooi: As 387 x 24 = 9 288, dan is 9 288 ÷ 24 = … (1)

GBV/Faktore/G7/K/Mo

8. Lys al die faktore van 625. (1)

PFA/Getalpatrone/G6/R/G

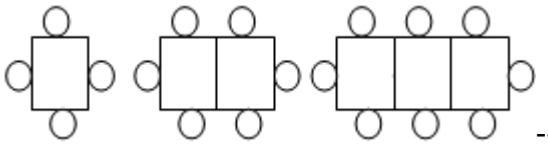
9. Balle word gerangskik in groepe soos voorgestel in die onderstaande tabel. Voltooi die tabel deur die ontbrekende getal in die ingekleurde blokkie in te vul.

Groep	1	2	3	9	
Aantal balle	3	5	7	19	51

(1)

PFA/Geometriese patrone/ G4/R/G

10. Teken die volgende figuur in die diagram patroon.
. (1)

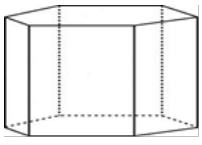


PFA/Getalpatrone/G6/P/Mo

11. As ek die natuurlike getalle van 1 tot 100 skryf, hoeveel keer sal ek die syfer 5 skryf?

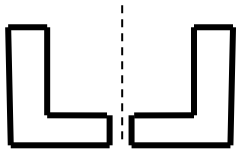
RV/Eienskappe van prismas/G6/K/G

12. Hoeveel hoekpunte het ‘n heksagonale prisma? (1)



RV/Transformasie/G6/K/M

13. Bestudeer die onderstaande vorms en benoem die soort transformasie. (1)

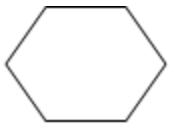


RV/Eienskappe van 2-D Vorms/G6/K/G

14. Benoem die 2-D vorm wat die volgende eienskappe het:
Twee pare oorstaande sye is gelyk, een hoek is gelyk aan 90^{o} en het vier lyne van simmetrie. (1)

RV/ Veelhoeke/G4/K/M

15. Benoem die 2-D vorm wat in die onderstaande diagram geïllustreer word?



(1)

M/Herleiding/G4/K/M

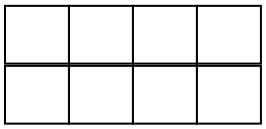
16. Voltooi: 1 000 m = … km (1)

M/Temperatuur/G5/K/M

17. Watter een van die temperature sal jy as baie koud beskou?
$22\,^{o}C$, $12\,^{o}C$, $2\,^{o}C$ (1)

M/Omtrek/Oppervlakte/G5/R/M

18. Die lengte van die sy van elke vierkant is 1 cm.



Bereken:

18.1 Die omtrek van die bostaande vorm. (1)

18.2 Die oppervlak van die bostaande vorm. (1)

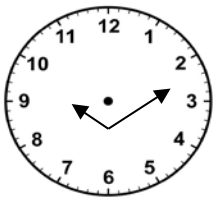
M/Tyd/G7/P/G

19. ‘n Volwasse hart klop ongeveer 78 slae per minuut.

Hoeveel keer sal ‘n hart in ‘n uur klop? (1)

M/Tyd/G6/K/G

20. Die analoog horlosie wyserplaat toon die tyd na sonsondergang op ‘n spesifieke dag. Skryf die tyd in digitale vorm (1)



M/Tyd/G6/R/G

21. Gebruik die tye wat in die raam gelys word om die vrae wat volg te beantwoord.

Tye van stede in verskillende tydsones.	
Naam van stad	Tyd
Parys	13:57
Londen	12:57
New York	07:57
San Francisco	04:57

21.1 Wat is die tydsverskil tussen Londen en New York? (1)

21.2 Wat sal die tyd in Parys wees as dit 13:45 in San Francisco is? (1)

M/Lengte/G6/R/G

22. Die onderstaande tabel toon die uitslae in die skool se finale verspring kompetisie.

Peggy	4,95 m
Zanele	4,29 m
Busi	4,08 m
Laetitia	4,87 m

Wie het tweede gekom? (1)

DH/ Waarskynlikheid/G6/KB/Mo

23. Die waarskynlikheid om kop te kry wanneer jy ‘n muntstuk opskiet is 1 uit 2.Die waarskynlikheid om ‘n 3 te kry wanneer jy ‘n dobbelsteen gooi is 1 uit 6.

Wat is die waarskynlikheid om een kaart uit ‘n pak van 52 te trek en ‘n twee te kry? (1)

DH/Piktogramme/G6/R/G

24. Bestudeer die volgende piktogram en beantwoord die vrae wat volg.

Sleutel: Elke  verteenwoordig 10 glase sap.

Aantal glase sap wat elke dag verkoop word	
Maandag	
Dinsdag	
Woensdag	
Donderdag	
Vrydag	

Hoeveel glase is Vrydag verkoop? (1)

DH/Data/G6/P/Mo

25. Leon het met 50 Graad 6 leerlinge ‘n onderhoud gehad oor hul televisie voorkeure. 41 het gesê hul verkies ‘n komedie, 35 het gesê hul geniet aksie films en 30 het gesê hul hou van beide.

Hoeveel leerders hou nie van enige van die bogenoemde nie? (1)

AFDELING C

GBV/Optel/G4/R/G

Toon alle stappe van berekening.

1. 6 254 + 3 874 (2)

GBV/Aftrek/G5/R/G

2. 69 157 − 17 239 (2)

GBV/Gewone Breuke/G5/R/G

3. $5\frac{1}{8}+3\frac{3}{8}$ (2)

GBV/Vermenigvuldiging/G6/R/G

4. 6 907 × 28 (3)

GBV/Deling/G6/R/Mo

5. 8 775 ÷ 26 (3)

GBV/Gewone Breuke/G6/R/Mo

6. $5\frac{11}{12} - 3\frac{5}{6}$ (3)

GBV/Persentasie/G7/K/G

7. Wat is die aantal wins wat gemaak word, wanneer ‘n kar gekoop word vir R120 000 en dit verkoop word teen ‘n wins van 30%. (3)

basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

DIAGNOSTIESE HULPBRON BANK: MERK RIGLYN
WISKUNDE: AFRIKAANS
GRAAD 6

Hierdie merk riglyn bestaan uit 11 bladsye.

Afdelings	Moeilikheids graad	Kognitiewe vlakke
A: veelvoudige keuse - vrae	**M:** maklik	**K:** kennis
B: kort eenpunt vrae	**G:** gemiddeld	**R:** roetine prosedures
C: vrae met langer bewerkings	**Mo:** moeilik	**KP:** Komplekse prosedures
		P: probleem oplossing

Vlakke van begrip
1: Daar is onverwante strategieë of oormatige afhanklikheid van die informasie wat in die vraag voorsien is en dit is verkeerd gebruik/gedupliseer.
2: Daar is sommige bewerkingsvaardighede wat **moontlik nie** verband hou met die vraag/onderwerp nie.
3: Daar is sekere konseptuelekennis en analiseringsvermoë, maar dit is inkonsekwent met bewerkings-/redenasie vermoë.
4: Korrekte antwoord. Die leerder is instaat om konstant korrek te demostreer / toe te pas deur gebruik te maak van die nodige redenerings vaardighede.

AFDELING A

1 punt per antwoord.

Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
2.	A	7 562	3	kennis van plekwaarde ontbreek			
	B	6 275	1	kennis van plekwaarde ontbreek			
	C	5 726 ✓	4	korrekte antwoord	K	M	4

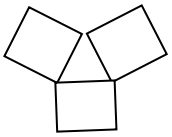
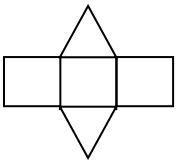
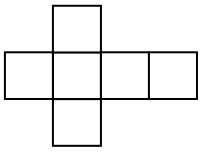
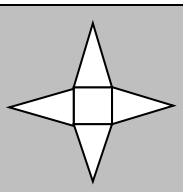
Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
	D	2 756	1	kennis van plekwaarde ontbreek			
3.	A	28 ✓	4	korrekte antwoord begin by 2,die verskil tussen opeenvolgende getalle vermeerder met 1	R	M	5
	B	21	1	het die verkeerde getal in die patroon ge identifiseer			
	C	16	1	het die verkeerde getal in die patroon ge identifiseer			
	D	12	1	het die verkeerde getal in die patroon ge identifiseer			
4.	A	7 duisend	1	kennis van plekwaarde ontbreek			
	B	7 honderd	1	kennis van plekwaarde ontbreek			
	C	7 ene	1	kennis van plekwaarde ontbreek			
	D	7 tiene ✓	4	korrekte antwoord.Die tiene syfer is onderstreep.	K	M	5
5.	A	766 000 000 ✓	4	korrekte antwoord 766 000 000 is groter	K	G	6
	B	765 000 000	1	kennis van vergelyking van getalle ontbreek			
	C	756 000 000	1	kennis van vergelyking van getalle ontbreek			
	D	764 000 000	1	kennis van vergelyking van getalle ontbreek			

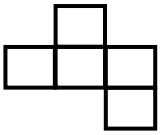
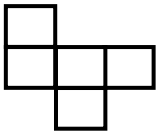
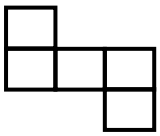
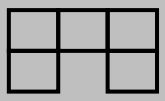
Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
6.	A	1 000✓	4	korrekte antwoord afgerond tot die naaste 1 000	R	G	5
	B	100	1	kennis van afronding ontbreek			
	C	10	1	kennis van afronding ontbreek			
	D	5	1	kennis van afronding ontbreek			
7.	A	$\frac{3}{3}$	1	slegs die ingekleurde dele getel			
	B	$\frac{6}{3}$	2	het die teller en noemer omgeruil			
	C	$\frac{1}{2}$ ✓	4	korrekte antwoord $\frac{3}{6}$ vereenvoudig	K	G	6
	D	$\frac{2}{1}$	2	het die teller en noemer omgeruil en vereenvoudig			
8.	A	4:8	3	het die verhouding wit tot swart balle gekies			
	B	2:1 ✓	4	korrekte antwoord 8:4 vereenvoudig	R	G	6
	C	4:1	1	het die verhouding verkeerd vereenvoudig			
	D	1:2	3	het die verhouding wit tot swart balle gekies en vereenvoudig			
9.	A	$(5 \times 6) + 2$	1	het die assosiatiewe eienskap verkeerd gebruik			
	B	$(5 \times 2) + 6$	1	het die assosiatiewe eienskap verkeerd gebruik			
	C	$(6 + 2) \times 5$ ✓	4	korrekte antwoord kommutatiewe eienskap korrek toegepas	R	G	6

Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
	D	(5 + 2) × 6	1	kommutatiewe eienskap verwar			
10.	A	600	2	verkeerd vermenigvuldig			
	B	625 ✓	4	korrekte antwoord 125 x 5	R	G	6
	C	130	1	het die 2 getalle opgetel			
	D	25	2	het die getalle gedeel			
11.	A	666	1	het deur 2 gedeel – bladsy aan linkerkant			
	B	667	4	het deur 2 gedeel- bladsy aan regterkant			
	C	36✓	1	korrekte antwoord berekening deur skatting 36 x 37	P	Mo	6
	D	37	3	regter bladsy			
12.	A	440 + 440 – 100✓	4	korrekte antwoord 440 verdubbel –100	P	G	6
	B	440 + 440 + 100	3	het die 2 bewerkings gemeng			
	C	440 + 100	1	het slegs getalle opgetel			
	D	440 – 100	1	het slegs getalle afgetrek			
12.	A	1; 2; 3; 4; 5; 6	1	genommer van 1 tot 6			
	B	6; 12; 18. 24 ✓	4	korrekte antwoord veelvoude van 6	K	G	6
	C	6; 9; 12; 15	1	veelvoude van 3			
	D	1; 2; 3; 6	1	faktore van 6			
13.	A	×	1	het dieselfde bewerking as wat gegee is gebruik			
	B	– ✓	4	korrekte antwoord	R	G	6

Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
	C	÷	1	het verkeerde bewerkingsteken as gevolg van die verkeerde bewerking aan die linkerkant van die is gelyk aan teken			
	D	+	1	het verkeerde bewerkingsteken as gevolg van die verkeerde bewerking aan die linkerkant van die is gelyk aan teken			
14.	A	3:13 ✓	4	korrekte antwoord eenvoudigste vorm	R	G	7
	B	3:12	2	kon nie die korrekte faktore van 9 en 39 identifiseer nie			
	C	1: 4	1	kon nie die korekte faktore van 9 en 39 identifiseer nie			
	D	1: 6	1	kon nie die korrekte faktore van 9 en 39 identifiseer nie			
15.	A	2 × 2 × 3 × 3 ✓	4	korrekte anwoord al die priemfaktore	R	Mo	7
	B	3 × 3 × 4	2	4 is nie ‘n priemgetal nie			
	C	2 × 2 × 9	2	9 is nie ‘n priemgetal nie			
	D	2 × 3 × 6	2	6 is nie ‘n priemgetal nie			
16.	A	Tel 50 en dan 25 by	3	verkeerde optelling			
	B	Tel 25 en dan 50 by ✓	4	korrekte antwoord	R	M	6

Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
	C	tel 50 by	1	het slegs een gemene verskil tussen die tweede en derde getal gevind			
	D	tel 25 by	1	het sleg een gemene verskil tussen die eerste en die tweede getal gevind			
17.	A	160	1	het nie die 4 afgetrek nie gegewe reël 8n – 4			
	B	164	1	het die 4 opgetel gegewe reël 8n – 4			
	C	158	1	berekenings fout			
	D	156 ✓	4	korrekte antwoord het die reël 8n – 4 toegepas	R	G	6
18.	A	6	1	het 4 sye en 2 diagonale opgetel			
	B	4	1	aangeneem dat die reghoek dieselfde aantal as die vierkant het			
	C	2✓	4	korrekte antwoord	K	M	5
	D	1	1	het een vertikale simmetrie-lyn gegee			
19.	A	'n Piramide met 'n reghoekige basis	2	korrekte antwoord	K	G	6
	B	'n Reghoekige prisma ✓	4	het na die basis van die piramide gekyk			
	C	'n Silinder	1	kon nie die eienskappe van 3-D voorwerpe identifiseer nie			
	D	'n Keël	2	het die piramide met 'n keël verwar			

Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
20.	A		1	kon nie die korrekte net identifiseer nie			
	B		3	het piramide met ‘n prisma verwar			
	C		1	kon nie die korrekte net identifiseer nie			
	D	 ✓	4	korrekte antwoord korrekte net	K	G	6
21.	A	‘n Stomphoek	2	verkeerde benaming van hoeke			
	B	‘n Skerphoek✓	4	korrekte antwoord korrekte naam	K	G	6
	C	‘n Regte hoek	1	verkeerde benaming van hoeke			
	D	‘n Inspringende hoek	2	verkeerde benaming van hoeke			

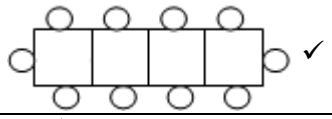
Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
22.	A		1	nie instaat om aansigte te visualiseer of te identifiseer nie			
	B		1	nie instaat om aansigte te visualiseer of te identifiseer nie			
	C		2	het gedeeltelike kennis van aansigte getoon			
	D	 ✓	4	korrekte antwoord	K	G	6
23.	A	'n 102 - minute film ✓	4	korrekte antwoord tussen 9 en 120 minute	R	M	4
	B	'n 121 - minute film	3	verkeerde herleiding			
	C	'n 150 - minute film	2	verkeerde herleiding			
	D	'n 59 - minute film	1	verkeerde herleiding			
24.	A	25 glase	2	gedeel deur 10			
	B	10 glase	2	gedeel deur 25			
	C	4 glase✓	4	korrekte antwoord eers 1 ℓ herlei na 1 000 m ℓ toe1 000 m ℓ gedeel deur 250 m ℓ	R	M	5
	D	1 Glas	1	nie instaat om te herlei nie			
25.	A	21 500	3	met tien vermenigvuldig in plaas van gedeel			
	B	2 150	1	Die aantal jare is gegee			
	C	21,5	2	dekades met eeue verwar			
	D	215 ✓	4	korrekte antwoord 2 150 gedeel deur 10	R	G	6

Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
26.	A	250 mℓ	1	vermenigvuldig met tien			
	B	100 mℓ ✓	4	korrekte antwoord 4 x 25 mℓ	R	G	6
	C	300 mℓ	1	die maksimum volume afgelees			
	D	275 mℓ	1	25 afgetrek van die maksimum volume			
27.	A	120 kubusse✓	4	korrekte antwoord 4 x 5 x 6 = 120 kubusse	R	G	6
	B	24 kubusse	2	het slegs die voorste blokkies getel			
	C	60 kubusse	2	het al die sigbare blokkies getel			
	D	30 kubusse	2	het die boonste blokkies getel			
28.	A	5	1	het die totale getal as 7 getel	K	M	5
	B	6	2	modus en mediaan verwar			
	C	7 ✓	4	korrekte antwoord die getal wat die eerste voorkom			
	D	8	1	het die grootste getal gekies			
29.	A	46 kg	2	het die aantal items verkeerd getel			
	B	60 kg	1	het die grootste getal gekies			
	C	45 kg ✓	4	korrekte antwoord die mediaan	K	G	6
	D	39 kg	1	geen kennis van die betekenis van mediaan			

Nr.		Verwagte Antwoord	Vlak van begrip		Kognitiewe vlak	Moeilikheids graad	Graad
30.	A	Meer as die helfte van die leerlinge ry met die bus of ry fiets skool toe. ✓	4	korrekte antwoord	P	Mo	6
	B	Meer as ‘n kwart van die leerlinge stap skool toe.	1	kon nie ‘n sirkelgrafiek lees nie			
	C	Meer as die helfte van die leerlinge stap of ry fiets.	1	kon nie ‘n sirkelgrafiek lees nie			
	D	Meer leerlinge stap skool toe as wat per kar ry.	1	kon nie ‘n sirkelgrafiek lees nie			

AFDELING B: een punt per antwoord

- **Aanvaar enige alternatiewe korrekte oplossing wat nie in die memorandum ingesluit is nie.**
- **Penaliseer slegs een keer vir dieselfde fout waar van toepassing.**
- **Ignoreer spelfoute.**
- **Aanvaar antwoorde wat in enige offisiële taal is behalwe as dit 'n woord is.**

Nr.		Verwagte Antwoord	Verduideliking	Punt	Kognitiewe vlak	Moeilikheids graad	Graad
1.		1 370 ✓		1	R	M	4
2.		4 ✓		1	K	M	5
3.		14 ✓		1	R	G	6
4.		$(4 + 3) \times 7 - 10 = 39$ ✓		1	R	Mo	6
5.		15 ✓	0 + 5 x 3 = 15	1	R	G	6
6.		976 521 ✓		1	K	M	5
7.		387 ✓		1	K	G	6
8.		625, 125, 25, 5, 1 ✓	Hoef nie in volgorde te wees nie.	1	K	Mo	7
9.		25 ✓	Reël 3 = 2 × 1 + 1 5 = 2 × 2 + 1 7 = 2 × 3 + 1 19 = 2× 9 + 1 51 = 2 x 25 + 1	1	R	G	6
10.		 ✓		1	R	G	4
11.		20✓	1 – 49 :5 keer 60 – 100 :4 keer 50 – 59 :11 keer	1	P	Mo	6
12.		18 Hoekpunte ✓		1	K	G	6
13.		Refleksie of Spieëlbeeld ✓		1	K	M	6
14.		'n Vierkant ✓		1	K	G	6
15.		Heksagoon ✓		1	K	M	4
16.		1 km ✓		1	K	M	4
17.		2^oC ✓		1	K	M	5
18.	18.1	12 cm ✓		1	R	M	5
	18.2	8 vierkante✓		1	R	M	5
19.		4680 ✓	60 x 78	1	P	G	7
20.		22:10 ✓		1	K	G	6
21.	21.1	5 ure✓		1	R	G	6
	21.2	22:45 ✓	9ure later	1	R	G	6

Nr.		Verwagte Antwoord	Verduideliking	Punt	Kognitiewe vlak	Moeilikheids graad	Graad
22.		Laetitia ✓		1	R	G	6
23.		4 uit 52 of ✓ 1 uit 13		1	C	Mo	6
24.		45 ✓		1	R	G	6
25.		4✓	50 – 30 – 11 – 5	1	P	Mo	6

FDELING C

Riglyne vir merking	
A	**Akkuraatheid**
KA	**Konsekwente Akkuraatheid**
M	**Metode**

- **Hierdie is 'n merkriglyn. In gevalle waar leerlinge verskillende maar logiese strategieë gebruik het om probleme op te los, moet hul (leerlinge) krediet daarvoor kry.**
- **Tensy anders gespesifiseer, met leerders wat slegs 'n korrekte antwoord gee volpunte kry.**
- **Onderstreep foute wat leerlinge maak en pas Konsekwente Akkuraatheid (KA) toe.**

Nr.		Verwagte Antwoord	Verduideliking	Punt	Kognitie we vlak	Moeilikheids	Graad
1.		6 254 + 3 874 10 128 ✓ ✓	Korrekte antwoord :2 punte 128 :1 punt 10 :1 punt Merk elke een as 'n eenheid Enige metode mag gebruik word	2		G	4
2.		69 157 −17 239 51 918 ✓ ✓	Korrekte antwoord :2 punte 918 :1 punt 51 :1 punt Merk elke een as 'n eenheid Enige metode mag gebruik word	2	R	G	5
3.		$5\frac{1}{8} + 3\frac{3}{8}$ $= 8\frac{4}{8}$ ✓✓ of $8\frac{1}{2}$	Korrekte antwoord: 2 punte 8: 1 punt $\frac{4}{8}$: 1 punt	2	R	M	5

Nr.		Verwagte Antwoord	Verduideliking	Punt	Kognitiewe vlak	Moeilikheids graad	Graad
4.		6907 × 28 55 256 ✓ +138 140 ✓ 193 396 ✓ of 6 907 × 28 = 6 907× 7 x 4✓ = 48 349 × 4✓ = 193 396✓ of 6 907 × 28 = 6 907 × 4x 7✓ = 27 628 × 7✓ = 193 396✓	Voorbeeld van KA: 6 907 × 28 55 256 ✓ +138 140 ✓ 193 396 ✓ 6 907 × 28 55 256 ✓ +138 145 x 193 401 ✓ 6907 × 28 55156 x +138140 ✓ 193296 ✓ 6907 × 28 55256 ✓ +138140 ✓ 194296 x	3	R	G	6

5.		✓✓ ✓ 3 3 7 res 13 26 | 8 7 7 5 - 7 8 9 7 - 7 8 1 9 5 - 1 8 2 1 3	Korrekte antwoord: 3 punte 337: 1 punt res13: 1 punt Metode : 1 punt	3	R	Mo	6
6.		$5\frac{11}{12} - 3\frac{5}{6}$ $= 2\frac{11}{12} - \frac{10}{12}$ ✓✓ $= 2\frac{1}{12}$ ✓	Korrekte antwoord: 3 punte 2: 1 punt $\frac{10}{12}$: 1 punt $2\frac{1}{12}$	3	R	Mo	6
7.		Wins = $\frac{30}{100}$ ✓ × R120 000 = 30 x R1200 ✓ of 3 x R12 000 = R36 000✓	1 honderdste van R120 000 = R1 200; 30 honderdstes of (30%) is R36 000	3	R	G	7

GRADE 9 MATHEMATICS AFRIKAANS

DIAGNOSTICS QUESTIONS & MEMO

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

DIAGNOSTIESE ITEMTOETS

WISKUNDE: AFRIKAANS

GRAAD 9

Instruksies aan die onderwyser

1. Hierdie vrae is opgestel om as ‘n diagnostiese assesserings hulpmiddel te dien.
2. Bestudeer asseblief die onderwyser riglyne voordat vrae geselekteer word.
3. Die vrae kan gebruik word volgens die afdelings/moeilikheidsgraad/ onderwerp/inhoudsarea/kognitiewe vlakke of graad.
4. Die keuse van die vrae sal afhang van die doel van die assessering.
   Bv:
   - Jy wil bepaal of graad 9 leerlinge in jou klas vaardig is in sekere graad 7 of 8 onderwerpe. Gevolglik sal jy graad 7 en 8 vrae uit die bepaalde inhoudsareas kies van die verskillende afdelings.
   - Dit mag dien as ‘n aanvangsassessering wat aan die begin van die jaar afgelê word.
   - Jy kan dan jou lesse vir jou graad 9 leerders beplan gebasseer op jou diagnostiese ontleding van die aanvangs assessering.
   - Op ‘n sootgelyke wyse kan jy vrae wat handel oor die verskillende onderwerpe in CAPS uitkies asook volgens die doel van die assessering.

5. Waar nodig moet die antwoorde afgerond word tot **twee** desimale plekke, tensy anders vermeld.

Let op na die volgende sleutels:

	Inhoudsarea	**Moeilikheidsgraad**	**Kognitiewe vlak**
GBV	Getalle, Bewerkings en Verhoudings	**M:** maklik	**K:** kennis
PFA	Patrone, Funksies en Algebra	**G:** gemiddeld	**R:** roetine prosedure
RV	Ruimte en Vorm (Meetkunde)	**Mo:** moeilik	**KB:** komplekse bewerking
M	Meting		**P:** probleemoplossing
DH	Data Hantering		
G (9)	Graad 9		

Neem kennis dat die kode bo elke vraag, soos hieronder aangedui, inligting in die volgede volgorde verskaf: inhoudsarea, onderwerp, graad, kognitiewe vlak en moelikheidsgraad. Bv.:

Inhoudsarea	Onderwerp	Graad 7	Kognitiewe vlak	Moeilikheidsgraad
GBV	Gewone breuke	G7	R	M

Daarna word dit bo-aan elke vraag geskryf in die formaat: **GBV/gewone breuke/G7/R/M**

AFDELING A

Omkring die letter langs die korrekte antwoord van vraag 1 tot vraag 50.

GBV/gewone breuke/G7/R/M

31. Wat is $\frac{3}{10}+\frac{5}{8}$ gelyk aan?

A $\frac{8}{18}$

B $\frac{37}{40}$

C $\frac{8}{40}$

D $\frac{15}{80}$

(1)

GBV/desimale breuke/G8/K/M

32. Skryf die waarde van $\sqrt[3]{0{,}008}$ neer.

A $0{,}024$

B $0{,}002$

C $0{,}24$

D $0{,}2$

(1)

GBV/telgetalle/G8/R/M

33. Verminder R$126{,}00$ in die verhouding $3:7$.

A R37,80

B R12,60

C R294

D R54

(1)

GBV/gewone breuke/G9/R/G

34. Bereken: $\frac{3}{5} - \frac{1}{2} \times \frac{1}{3}$.

A $\frac{13}{30}$

B $\frac{2}{30}$

C $\frac{1}{10}$

D $\frac{2}{9}$

(1)

GBV/gewone breuke/G9/R/G

35. Bereken $\sqrt{\frac{9}{16}} \div \sqrt{\frac{1}{4}}$.

A $\frac{9}{4}$

B $\frac{3}{2}$

C $\frac{2}{3}$

D $\frac{3}{8}$

(1)

GBV/eksponente/G9/K/M

36. Wat is die produkte van 3^{3} en 3^{-1}?

A 3^{-3}

B 9^{-3}

C 3^{2}

D 9^{2}

(1)

37. V

(1)

GBV/desimale breuke/G9/K/M

7. Watter soort getal is $-0,\dot{2}$?

A ‘n Natuurlike getal.

B ‘n Irrasionale getal.

C ‘n Rasionale getal.

D ‘n Heelgetal.

(1)

GBV/eksponente/G9/K/M

8. Skryf $0,00578$ in wetenskaplike notasie.

A $57{,}8 \times 10^{-3}$

B $5{,}78 \times 10^{-3}$

C $5{,}78 \times 10^{-4}$

D $5{,}78 \times 10^{3}$

(1)

GBV/telgetalle/G10/R/G

9. Voltooi: $\sqrt{\sqrt{400} + \sqrt{100} + 6} = \ldots$

A 506

B 416

C 256

D 6

(1)

GBV/gewone breuke/G7/K/M

10. Skryf $\frac{2}{5}$ as ‘n persentasie.

A $20\ \%$

B $40\ \%$

C $50\ \%$

D $70\ \%$

(1)

GBV/telgetalle/G7/R/G

11. ‘n Selfoon wat R1 200 gekos het, is verkoop teen ‘n verlies van $20\ \%$.

Bereken die verkoopsprys van die selfoon.

A R60

B R240

C R960

D R1440

(1)

GBV/telgetalle/G8/KB/G

12. Maria koop ‘n rok vir R395,00 en verkoop dit vir R250,00. Bereken die persentasie verlies korrek tot een desimale plek.

A 169,3%
B 145,0%
C 36,7%
D 58% (1)

GBV/telgetalle/G7/R/M

13. Janet reis ‘n totale afstand van 540 km teen ‘n gemiddelde spoed van 120 km/h. Hoe lank het sy gereis?

A 13,3 ure
B 11 ure
C 7 ure
D 4,5 ure (1)

GBV/telgetalle/G8/KB/G

14. Indien dit 4 ure neem om 380 km te reis, hoe lank sal dit neem om 570 km teen dieselfde gemiddelde spoed te voltooi?

A 1,5 ure
B 2,4 ure
C 2,7 ure
D 6 ure (1)

GBV/telgetalle/G9/KB/G

15. ‘n Busbestuurder voltooi ‘n sekere afstand in 3 ure teen ‘n gemiddelde spoed van 80 km/h. Hoe lank sal die reis neem teen ‘n gemiddelde spoed van 50 km/h?

A 0,2 ure
B 0,6 ure
C 1,9 ure
D 4,8 ure (1)

GBV/telgetalle/G8/R/G

16. Bereken die enkelvoudige rente wat verdien word na 3 jaar op ‘n belegging van R3 200 teen 12,5 % per jaar.

A R40 000
B R9 600
C R1 200
D R400 (1)

GBV/telgetalle/G8/R/M

17. Wat sal R4 500,00 werd wees indien dit vir 4 jaar teen 13 % enkelvoudige rente per jaar belê word?

A R6 840,00
B R5 085,00
C R4 499,48
D R2 340,00 (1)

GBV/telgetalle/G9/KB/G

18. Bereken hoe lank dit sal neem vir ‘n belegging van R4 000 teen 3 % enkelvoudige rente per jaar om rente van R840 te verdien.

A 14,3 jare
B 7 jare
C 63 jare
D 1,59 jare (1)

GBV/telgetalle/G9/R/G

19. Bereken die finale bedrag wat ek in my spaarrekening sal hê as ek R600 vir 2 jaar teen ‘n koers van 6 % per jaar saamgestelde rente belê.

A R72,00
B R530,16
C R674,16
D R1 272,00 (1)

PFA/algebraïese vegelykings/G8/R/M

20. Bereken die waarde van x as $2(3-x)=8$.

A -7
B -3
C -2
D -1 (1)

PFA/algebraïese uitdrukkings/G7/K/M

21. Voltooi: In die uitdrukking $2x-4$ is die veranderlike en die konstante onderskeidelik …

A 2 en -4
B x en -4
C x en 4
D 2 en 4 (1)

PFA/numeriese patrone/G7/R/G

22. Voltooi: Die reël vir die getalry $4\,;7\,;10\,;13$ is …

A $3n-1$, waar n die posisie van die term is.
B $n+3$, waar n die posisie van die term is.
C tel drie by die vorige term.
D $3n+3$, waar n die posisie van die term is (1)

PFA/eksponente/G8/K/M

23. Voltooi: $(a+b)^0=\ldots$

A $a+b$
B 2
C 1
D 0 (1)

PFA/funksies en verwantskappe/G8/R/G

24. Wat is die verwantskap tussen x en y in die onderstaande tabel?

x	1	2	3	4
y	1	5	9	13

A $y = 4x - 3$
B $y = 3x - 2$
C $y = 2x - 1$
D $y = x + 4$

PFA/algebraïese uitdrukkings/G7/R/M

25. Voltooi: As $x = 3$, is die waarde van y in die vergelyking $y = 4x - 3$ …

A 40
B 9
C 4
D 0 (1)

PFA/algebraïese uitdrukkings/G8/K/M

26. Wat is die koëffisient van c in die uitdruikking

$7a + 6b - c$?

A 4
B 3
C 2
D 1 (1)

PFA/algebraïese vegelykings/G8/R/G

27. Skryf die algebraiese uitdruikking wat pas by die bewering.
Die som van half ‘n nommer en ‘n ander nommer.

A $\frac{1}{2}(x + y)$
B $\frac{1}{2}x + y$
C $\frac{1}{2} + x$
D $\frac{1}{2}x + y$

(1)

PFA/algebraïese vegelykings/G9/R/G

28. Voltooi: Die waardes van x in die vergelyking $(x+1)(2x-1)=0$ is …

A $-1\ of\ -\frac{1}{2}$
B $-1\ of\ \frac{1}{2}$
C $1\ of\ 2$
D $1\ of\ \frac{1}{2}$ (1)

PFA/algebraïese vegelykings/G9/R/G

29. Wat is die waarde van x as $3^x = \frac{1}{9}$?

A -3
B -2
C 2
D 3 (1)

PFA/algebraïese uitdrukkings/G9/KB/G

30. Voltooi: $\frac{x}{y} - 1 = \ldots$

A $x-y$
B $\frac{y-x}{y}$
C $\frac{x-y}{y}$
D $\frac{x-1}{y}$ (1)

PFA/algebraïese vegelykings/G9/KB/G

31. Voltooi: As $x=3$ in die vergelyking $x^2+x+t=0$, dan is die waarde van t …

A -12
B -9
C 12
D 9 (1)

PFA/grafieke/G9/R/G

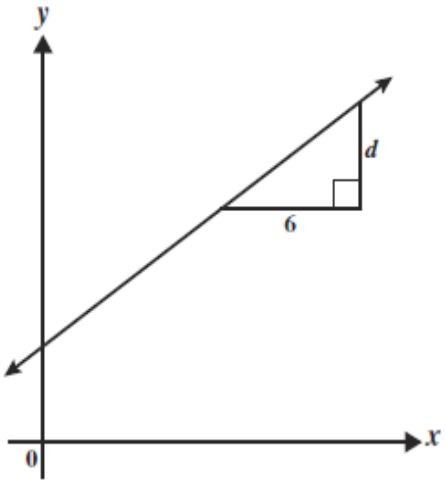
32. Wat is die y-afsnit van die grafiek gedefinieer deur $4\,x\, +\, 2\,y\, =\, 12$?

A -6
B 12
C 6
D 3

(1)

PFA/grafieke/G9/R/G

33.



Die gradiënt van die bostaande lyn is $\frac{2}{3}$. Wat is die waarde van d?

A 9
B 4
C 2
D $\frac{1}{9}$

(1)

RV/meetkunde van 2D vorms/G7/K/M

34. Voltooi: 'n … is 'n vierhoek waar alle hoekpunt hoeke regte hoeke is.

A Reghoek
B Trapesium
C Ruit
D Vlieër

(1)

RV/meetkunde van 2D vorms/G7/K/M

35. Voltooi: Die lynstuk wat ‘n sirkel in 2 gelyke dele verdeel, word ‘n ..... genoem.

A omtrek
B middellyn
C radius
D koord (1)

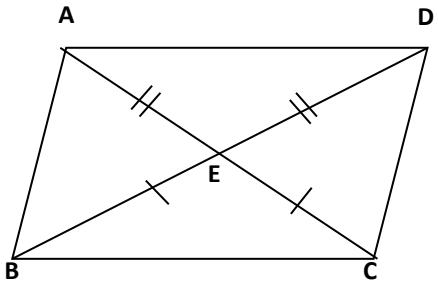
RV/meetkunde van 3D voorwerpe/G8/K/G

36. ‘n Platoniese veelvlak met 8 syvlakke is ...

A ‘n dodekaëder
B ‘n oktaëder.
C ‘n heksaëder.
D ‘n tetraëder. (1)

RV/meetkunde van 2D vorms/G9/R/G

37. Voltooi: In vierhoek $ABCD$ is $AE = ED\ en\ BE = EC$. Dus is …



A ∆AEB ||| ∆CED.
B ∆AED ||| ∆BEC.
C ∆AEB≡∆DEC.
D ∆AED≡∆BEC. (1)

RV/meetkunde van 3D voorwerpe/G9/K/G

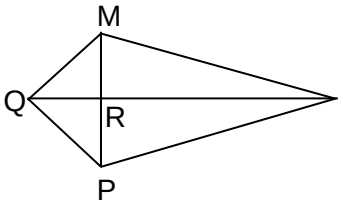
38. Wat is die grootte van elke binnehoek in ‘n reëlmatige heksagoon?

A $120°$
B $108°$
C $100°$
D $90°$ (1)

RV/meetkunde van 2D vorms/G9/KB/G

39. Voltooi : In die vlieër MNPQ is $MQ = PQ$, $MN = PN$ en $M\hat{Q}P = 30°$.

Dit beteken dat $Q\hat{M}R = \ldots$



A $90°$
B $75°$
C $30°$
D $15°$

(1)

RV/meetkunde van 3D voorwerpe/G8/K/M

40. Voltooi:

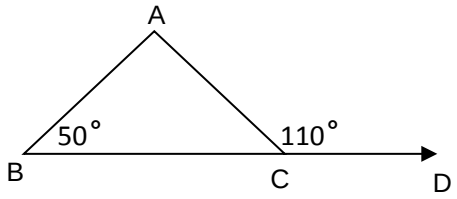
Die 3D voorwerp wat slegs 'all die syvlakke van 'n vierkant het, word 'n ... genoem.

A silinder
B piramide
C sfeer
D kubus

(1)

RV/meetkunde van reguit lyne/G8/KB/M

41. In die onderstaande figuur is $\hat{B} = 50^\circ$ en $A\hat{C}D = 110^\circ$.



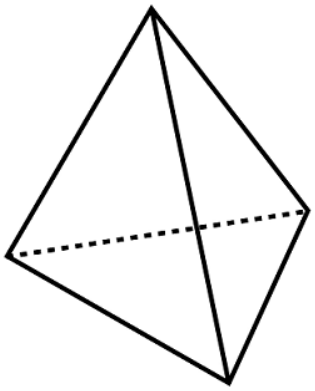
Voltooi: Die grootte van $\hat{A}$ is …

A 160°
B 110°
C 80°
D 60°

(1)

RV/meetkunde van 3D voorwerpe/G7/K/M

42. Identifiseer die onderstaande 3D voorwerp.



A ‘n Reghoekige prisma.
B ‘n Driehoekige prisma.
C ‘n Piramide.
D ‘n Kubus. (1)

RV/meetkunde van 3D voorwerpe/G7/K/M

43. Voltooi: ‘n Heksagonige prisma het … kante.

A 6
B 8
C 12
D 18 (1)

RV/transformasie meetkunde/G9/R/G

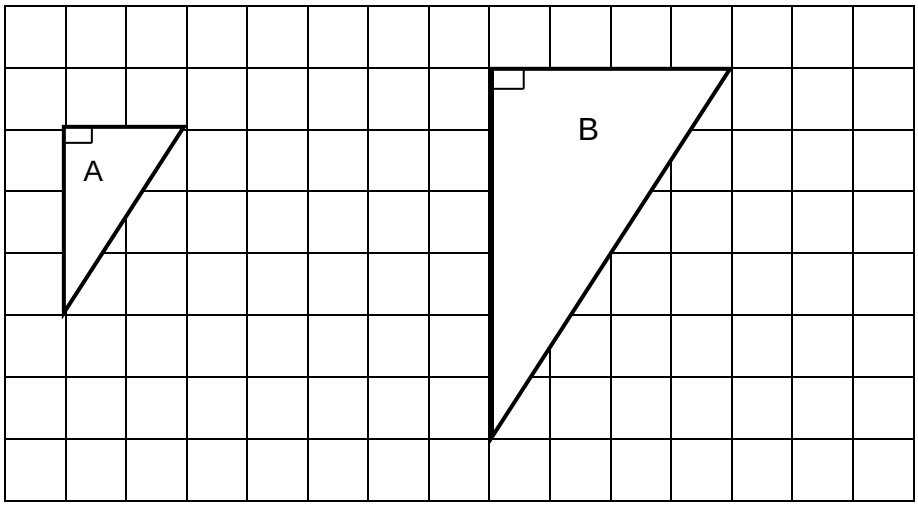
44. Transleer punt $B(-2;3)$ 3 eenhede na regs en 4 eenhede afwaarts.

Voltooi: Die koördinate van sy spieëlbeeld B' is….

A $B'(-2;-3)$
B $B'(1;-1)$
C $B'(-5;7)$
D $B'(2;3)$ (1)

RV/transformasie meetkunde /G7/K/M

45. Voltooi: Die transformasie van figuur A na figuur B is …



A ‘n refleksie.

B ‘n verkleining.

C ‘n vergroting.

D ‘n rotasie. (1)

DH/analiseer data/G7/R/G

46. Bereken die gemiddeld van die volgende toetspunte.

11 12 12 12 13 15 17 18 25

A 14

B 13

C 15

D 12 (1)

DH/analiseer data/G8/K/G

47. Bereken die mediaan van die volgende toetspunte.

18 11 12 13 15 17 12 25 12

A 14
B 13
C 15
D 12 (1)

DH/waarskynlikheid/G7/R/M

48. Wat is die waarskynlikheid om ‘n rooi AAS vanuit ‘n pak van 52 speelkaarte te trek?

A $\frac{13}{52} = \frac{1}{4}$

B $\frac{2}{52} = \frac{1}{26}$

C $\frac{4}{52} = \frac{1}{13}$

D $\frac{26}{52} = \frac{1}{2}$ (1)

DH/waarskynliheid/G8/K/G

49. Bepaal die waarskynlikheid om ‘n onewe vierkantsgetal te kry as ‘n dobbelsteen een keer gegooi word.

A $\frac{2}{6} = \frac{1}{3}$

B 1

C $\frac{3}{6} = \frac{1}{2}$

D $\frac{1}{6}$ (1)

DH/ waarskynliheid /G9/P/G

50. Daar is 4 konings in ‘n pak van 52 speelkaarte. ‘n Koning word uit die pak gehaal en word nie teruggeplaas voordat ‘n ander kaart getrek word nie. Wat is die waarskynlikheid om weer ‘n koning te trek?

A $\frac{3}{51}$

B $\frac{4}{52}$

C $\frac{3}{52}$

D $\frac{4}{51}$ (1)

AFDELING B

GBV/gewone breuke/G7/K/M

1. Skryf die verhouding $\frac{4}{13} : \frac{7}{13}$ in die eenvoudigste vorm neer. (1)

GBV/telgetalle/G7/R/M

2. Twee getalle word in faktorvorm gegee as:
$2 \times 2 \times 3 \times 5 \times 7$ en $2 \times 3 \times 7 \times 7$. Wat is die GGF van die twee getalle? (1)

GBV/eksponente/G8/K/M

3. Skryf $7\,530\,000$ in wetenskaplike notasie. (1)

GBV/gewone breuke/G8/R/M

4. Voltooi: $0{,}01 \times 10^2 \times \frac{1}{3} = \ldots$ (1)

GBV/telgetalle/G7/R/M

5. Voltooi : Die GGF van 24 en 32 is … (1)

GBV/telgetalle/G7/R/M

6. Vereenvoudig die verhouding $\text{R}250 : \text{R}150 : \text{R}100$. (1)

GBV/telgetalle/G9/R/G

7. Wat is $100\,\%$ van ‘n massa as $35\,\%$ van die massa 140 g is? (1)

GBV/gewone breuke/G8/KB/G

8. Bereken $8\left(\frac{1}{8} - \sqrt{\frac{1}{16}}\right)$ (1)

GBV/eksponente/G9/R/M

9. Skryf $6{,}7 \times 10^{-3}$ in standaard-notasie. (1)

GBV/telgetalle/G9/K/M

10. Watter een van die volgende gegewe getalle is irrasionaal?
$\sqrt{25}$, $\sqrt{5}$, 3,15, $\frac{2}{3}$ (1)

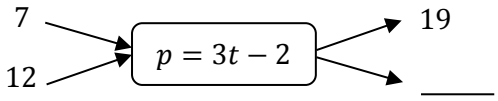
GBV/eksponente/G10/R/G

11. Voltooi: $\left(6^{2/3}\right)^3 = \ldots$ (1)

PFA/numeriese patrone/G7/R/G

12. Voltooi die vloeidiagram deur die gegewe reël te gebruik.

Invoer Reël Uitvoer



(1)

PFA/algebraïese vegelykings/G7/R/M

13. Los die volgende vergelyking op deur inspeksie: $7x = 91$

PFA/algebraïese uitdrukkings/G7/R/M

14. Bereken die waarde van $a + 12$, as a = 13. (1)

PFA/algebraïese uitdrukkings/G8/K/M

15. Skryf die koëffisient van x in die uitdrukking $-6x + 4$ neer. (1)

PFA/algebraïese uitdrukkings/G8/K/M

16. Voltooi: $2x^2 + 3x^2 = \ldots$ (1)

PFA/algebraïese uitdrukkings/G8/KB/G

17. Voltooi: $(7x)^2 + 11x^2 = \ldots$ (1)

PFA/eksponente/G8/K/M

18. Voltooi: $x^3 \times x^2 = \ldots$ (1)

PFA/eksponente/G9/K/G

19. Voltooi: $4^x \times 4^x = \ldots$ (1)

PFA/numeriese patrone/G8/R/M

20. Voltooi die volgende getalry.

$1\ ;\ -3\ ;\ 9\ ;\ -27\ ;$ __ . (1)

PFA/grafieke/G8/K/M

21. Is die volgende bewering waar of onwaar?

Die punt A$(-1; -2)$ lê in die 3e kwadrant. (1)

PFA/numeriese patrone/G7/R/G

22. Voltooi die volgende getalry.

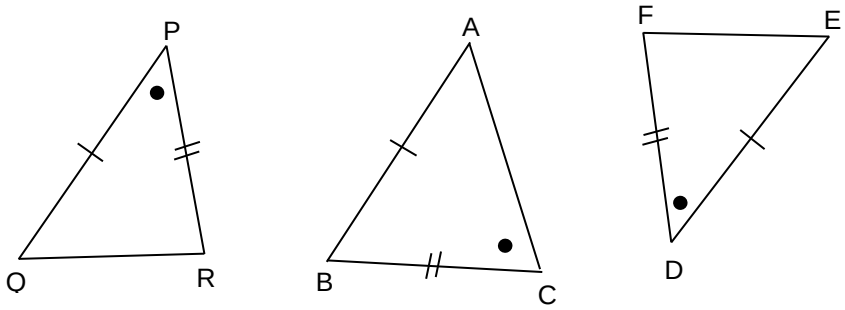
$3\ ;9\ ;\ 27\ ;\ 81\ ;$ __. (1)

RV/meetkunde van 2D vorms/G8/K/M

23. Voltooi: Die som van die binnehoeke van ‘n driehoek is gelyk aan … (1)

RV/meetkunde van 2D vorms/G7/K/G

24.



Voltooi: Die driehoek wat kongruent is aan ΔPQR is … (1)

RV/meetkunde van 2D vorms/G8/K/M

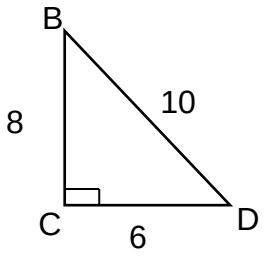
25. Voltooi: In ΔABC is $B = AC$. Dit beteken dat $\hat{B} =$ … (1)

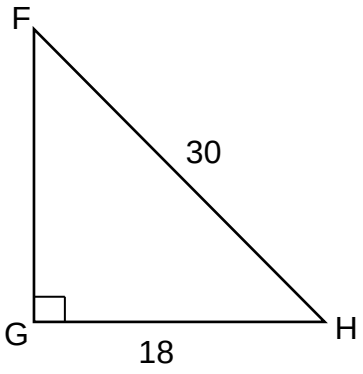
RV/meetkunde van 2D vorms/G8/R/M

26. *Voltooi:* In ΔABC is $\hat{A} = 40°$ en $\hat{C} = 30°$. Dit beteken *dat* $\hat{B} =$ *…* (1)

RV/meetkunde van 2D vorms/G9/R/G

27. In ΔBCD en ΔFGH is $BC = 8$ cm, $CD = 6$ cm, $BD = 10$ cm, $GH = 18$ cm en $FH = 30$ cm.





Is die driehoeke kongruent of gelykvormig? (1)

M/oppervlakte en omtrek van 2D vorms/G7/R/M

28. Wat is die oppervlakte van ‘n reghoek as die lengte $= 17$ cm en die breedte $= 12$ cm? (1)

M/ oppervlakte en omtrek van 2D vorms /G9/K/M

29. Die sye van ‘n vierkant word verdubbel. Skryf die waarde van k neer as die omtrek van die vergrote vierkant= $k \times$ die omtrek van die oorspronklike vierkant. (1)

DH/waarskynlikheid/G8/K/M

30. ‘n Kartonhouer bevat 3 blou, 4 wit en 5 groen albasters wat almal ewe groot is. Wat is die waarskynlikheid dat ‘n persoon ‘n groen alabaster lukraak sal uithaal? (1)

AFDELING C

Toon al die stappe van bewerking aan.

GBV/telgetalle/G8/KB/G

1. Bereken sonder die gebruik van ‘n sakrekenaar. Toon die stappe van bewerking aan.

   $-4^3 \div \sqrt{64}$ (3)

GBV/eksponente/G9/R/G

2. Bereken sonder die gebruik van ‘n sakrekenaar. Toon die stappe van bewerking aan.

   $\frac{2\times3^2\times5^4}{5^3\times8^0}$ (3)

GBV/eksponente/G10/R/M

3. Bereken $3^{\frac{1}{2}} \times 3^{\frac{1}{2}} \times 3^0$. (2)

PFA/algebraïese uitdrukkings/G10/R/G

4. Bereken die produk van $2x - 1$ en $x^2 + 2x - 3$. (3)

PFA/algebraïese uitdrukkings/G9/R/G

5. Faktoriseer volledig:

   5.1 $10t^2 - 5t$ (2)

   5.2 $81 - 100a^2$ (2)

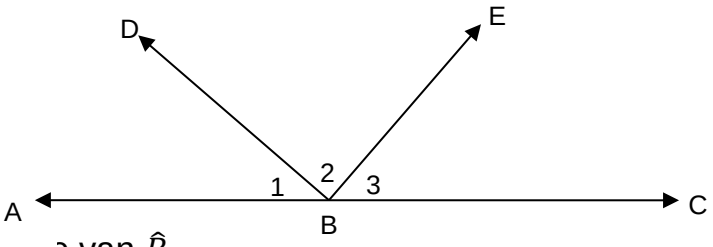
   5.3 $x^2 + 5x + 6$ (2)

PFA/grafieke/G9/R/G

6. Op dieselfde assestelsel, teken en benoem die grafieke gedefinieer deur $y = -\frac{2}{3}x + 1$ en $y = \frac{3}{2}x - 1$. Merk die snypunte van elke grafiek op die X-as en die Y-as duidelik. (7)

RV/meetkunde van reguit lyne/G8/R/M

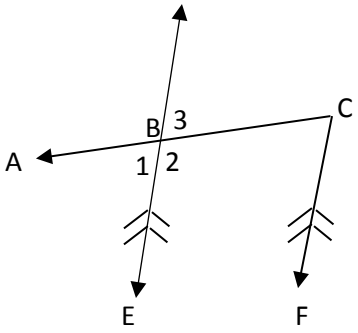
7. In die onderstaande figuur is ABC is 'n reguit lyn, $\hat{B}_2 = 75°$ en $\hat{B}_3 = 55°$.



Bepaal, met redes, die grootte van $\hat{B}_1$. (3)

RV/meetkunde van reguit lyne/G8/K/M

8. In die figuur is $\hat{B}_3 = 35°$ en $BE \parallel CF$.



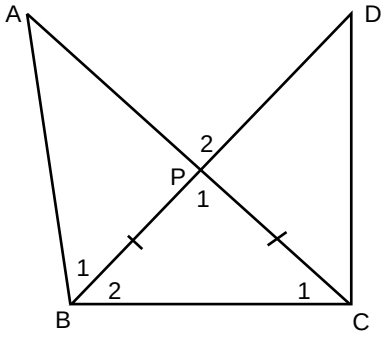
Bereken, met redes, die grootte van:

8.1 $\hat{B}_1$ (2)

8.2 $\hat{C}$ (2)

RV/meetkunde van 2D vorms/G9/KB/G

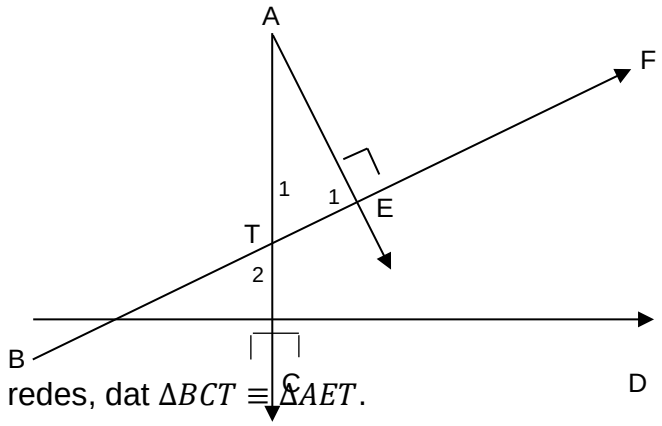
9. In die figuur is $BP = PC$ en $\hat{P}_2 = 80°$.



Bereken, met redes, die grootte van $\hat{B}_2$. (6)

RV/meetkunde van 2D vorms/G9/P/G

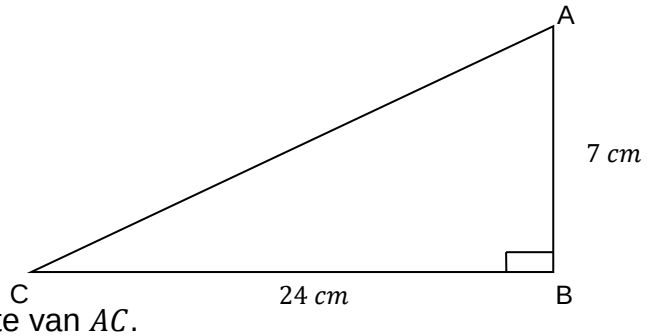
10. In die onderstaande figuur is $AE \perp BTF$, $ATC \perp BD$ en $BC = AE$.



Bewys, met redes, dat $\Delta BCT \equiv \Delta AET$. (5)

M/Stelling van Pythagoras/G8/R/G

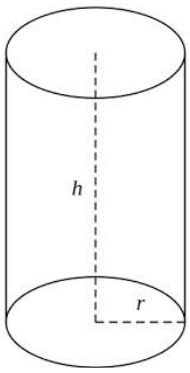
11. In ΔABC is $\hat{B} = 90°$, $AB = 7$ cm en $BC = 24$ cm.



Bereken die lengte van AC. (3)

M/buite-oppervlakte en volume van 3D voorwerpe/G9/R/G

12. 'n Soliede silinder het 'n basis met die radius $= 7$ cm, die hoogte $= 16$ cm en $\pi = \frac{22}{7}$.



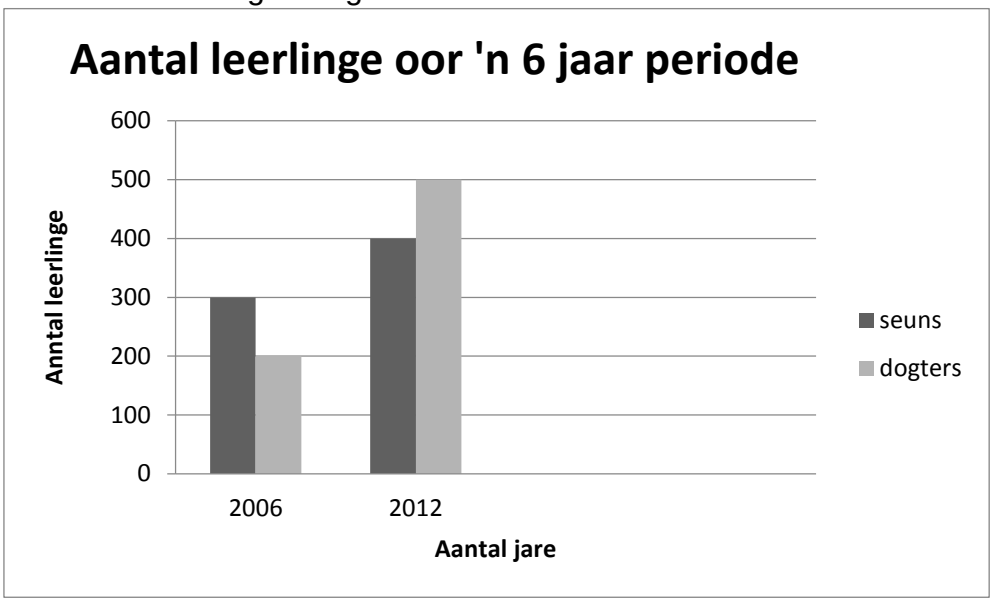
Bereken die buite-oppervlakte van die silinder. (4)

M/ buite-oppervlakte en volume van 3D voorwerpe /G9/R/G

13. Die volume van ‘n reghoekige tenk is 7000 m^3, die lengte $= 25$ m en die breedte$= 80$ m. Bereken die hoogte. (3)

DH/interpretasie/G7/K/M

14. Bestudeer die volgende grafiek



14.1 Wat was die totale aantal leerlinge in 2006? (1)

14.2 Wat was die vermeerdering in die aantal dogters van 2006 tot 2012? (1)

14.3 Wat was die verskil tussen die aantal seuns en dogters in 2012? (1)

DH/interpretasie/G7/R/M

15. Die onderstaande stingel-en-blaar grafiek verteenwoordig die ouderdomme, in jare van ‘n groep onderwysers.

Stingel	Blare						
2	5	8					
3	4	5	5	5			
4	0	0	2	7	9		
5	0	0	0	0	5	5	8

15.1 Bepaal die gemiddelde ouderdom van die onderwysers. (3)

15.2 Wat is die modus van die ouderdomme van die onderwysers? (1)

15.3 Bepaal die mediaan van die ouderdomme van die onderwysers. (2)