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A cardboard box that is used to make packaging boxes for a florist consists of a cube and a square pyramid, as indicated in the sketch. The dimensions of the cube are 350mm and the slanted height of the pyramid is also 350mm.

Calculate the number of containers that could be made from 100m<sup>2</sup> cardboard if it is assumed that the nets cover 100% of the cardboard.

A cube

Sketch the inverse graph of  $g(x) = 2^x$

$x = 2^y$

$\log_2 x = y$

$\frac{a}{b+c} = a \div (b+c) \neq \frac{a}{b} + \frac{a}{c}$

**Afrikaans**

**Video** eLearning vir skoliere

**English**

**Video** eLearning for students

# WISKUNDE MATHEMATICS Gr 9



Kurrikulum en assesseringsbeleidverklaring  
Curriculum policy assessment statement



# WELCOME

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# INDEKS

## Afrikaans

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## Grade 9 / Graad 9

<b>Integers</b>	<i>This section of the syllabus deals with positive and negative whole numbers as the name suggests, but it also involves proportionality (ratio and rate) and even financial mathematics.</i>
Pure integer numbers	2626 / 2774 / 3756 / 4379 / 4605 / 4645 / 4647 / 4649 / 4653
Number systems	2884 / 2885 / 4600 / 4697 / 4698 / 4710
Prime factorization	263 / 3755 / 4061 / 4566
Ratio and Rate	1680 / 2012 / 2013 / 2601 / 3766
Direct and Inverse Proportions	124 / 4325 / 4522
Financial Mathematics	166 / 3766 / 4499 / 4711 / 1587 / 4543 / 4828

<b>Fractions</b>	<i>Revision of skills that should have been established, dealing mostly with normal fractions, decimals and percentages, but also focussing on mixed numbers and recurring decimals.</i>
Operations with fractions	49 / 52 / 86 / 126 / 143 / 2111 / 2113 / 2602 / 2605 / 2613 / 2621 / 2624 / 2885 / 2886 / 3778 / 4726
Equivalence: <i>Fractions, Decimals and Percentages</i>	2591 / 2595 / 2597 / 2599 / 2882 / 3759
Rounding of decimals	2592 / 4513 / 4531 / 4837
Operations with decimal fractions	2615 / 2618 / 2886 / 4496 / 4749
Comparing and arranging decimal fractions	2619 / 4836

<b>Exponents</b>	<i>Exponents makes it easy to write large multiplications, but in order to use it properly there are exponential laws that must be mastered</i>
Scientific notation	2434 / 2436 / 3770 / 4568 / 4757
Laws of exponents	138 / 4542
Working with exponents	52 / 122 / 138 / 2076 / 2113 / 4186 / 4413 / 4444 4542 / 4915

<b>Number patterns</b>	<i>Number patterns are typically generated by adding or subtracting a constant number, and then it is referred to as being "linear". For the purposes of this index when there is a constant number being multiplied, it is also considered as linear, however when no such fixed pattern exists, it is referred to as being non-linear, which is a type of pattern that the learner should also be able to work with</i>
Linear patterns	25 / 1891 / 4307 / 4343 / 4439 / 4468 / 4470 4564
Non-linear patterns	4117 / 4815 / 4921

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Functions and Relationships	<i>The section on number patterns also relies on tables with input and output values linked to a rule (formula) and flow charts are also interlinked with these values. Ideally these formula-bound systems should be categorized as a function (number machine) and hence they are listed here. Ultimately, though, the section on “Functions” in Grade 9 is heading towards the straight line graph.</i>
The link with patterns	1959 / 4523 / 4814
The straight line graph	153 / 1034 / 1035 / 2384 / 2386 / 4522 / 4592

Algebraic expressions	<i>An algebraic expression is typically identified by the use of alphabetical letters we call variables. Since these variables are used in formulas, they represent numbers but have to be handled differently from pure numbers – with its own set of laws and techniques.</i>
Operations with algebraic expressions	52 / 1833 / 1836 / 2075 / 2518 / 2586 / 4373 / 4374 / 4494
Factorisation	162 / 227 / 4014 / 4497
Algebraic fractions	238 / 1216 / 1228 / 3979 / 4413 / 4725 4848

Algebraic equations	<i>A big portion of the reasons for doing Algebra belongs to equations – it is a very important part of the bigger picture. It started in Grade 7, for all intents and purposes, but get gradually more complex into the High School years. Equations can also be seen as formulas, hence the inclusion of substitution and tables in this category.</i>
Linear equations	24 / 95 / 4516 / 4602 / 4855
Generating tables	4380 / 4534 / 4592
Quadratic equations	91 / 4851
Word sums	24 / 155 / 4374 / 4474 / 4494 / 4602 / 4610 4709 / 4855

Geometry	<i>Geometry gets real tricky when the concept of Statement and Reasons are added in Grade 8, and gradually a lot more emphasis are placed on identifying and using the appropriate theorems.</i>
Triangles	4264
Quadrilaterals	1792 / 3018
Statement and Theorem	4268 / 4933

Triangles	<i>The geometry of triangles have been dealt with in the previous section – here the curriculum focuses on a specific type of triangle only, namely the right-angled triangle, and more specifically the Theorem of Pythagoras that is applicable to right-angled triangles.</i>
The Theorem of Pythagoras	1299 / 1300 / 4519

Measurement	<i>The title of this section is carried over from Primary School grades, when the dimensions of objects were still physically measured, yet it has taken on a completely new character, where properties are required to be calculated.</i>
Perimeter	4668 / 4670
Area and Surface Area	2305 / 4641 / 4693 / 4838
Volume	90 / 124 / 140 2301
Mixed	4630 / 4539 / 4642 / 4879

Graphs	<i>The straight line graph has been covered in the section of Functions, but only as a “number machine”. In this section other aspects of the graph are also addressed.</i>
Straight line graphs	153 / 1034 / 1035 / 4522 / 4592

Transformations	<i>An important part of Transformation in early years have been the introduction of the coordinate axes, which is the only real part being taken forward after Grade 9, apart from familiarity with transformations. The different parts of Transformations are consolidated in Grade 9, however, when formulas are introduced to describe the various changes.</i>
Coordinates	4380 / 4534 / 4565
Translations	2643
Rotations	2682
Enlargement and Reduction	2686
Reflections	4562

Data	<i>Statistics is a very wide subject area, and it gradually gets more complex with each academic year. It can, however, be sorted in three main parts, namely Central Tendency (Mode, Median and Mean), Central Dispersion (Range) and Representation and Reporting (all the various graphs).</i>
Central tendency	2782 / 2786 / 2792 / 4811
Graphs	75 / 2474 / 4133 / 4505

Probability	<i>Probability is a very complex discipline in Mathematics, and need to be introduced in small bite-sized chunks with every passing academic year. In grade 9 one such small step forward is made.</i>
Tree diagrams	4656

<b>Heelgetalle</b>	<i>Hierdie afdeling van die sillabus hanteer positiewe en negatiewe getalle, maar dit omvat ook ander afdelings soos verhouding en koers en selfs finansiële Wiskunde</i>
Suiwer heelgetalle	80 / 163 / 203 / 539
Getallestelsels	307 / 4617
Priemfaktorisering	205 / 261 / 262 / 292 / 294 / 296 / 297 / 299 / 364 / 4555
Verhouding en koers	21 / 3705 / 4171 / 4891 / 4893
Direkte en Omgekeerde Eweredigheid	1731 / 1810
Finansiële Wiskunde	200 / 1588 / 1730 / 1804

<b>Breuke</b>	<i>Hersiening van vaardighede wat alreeds in plek behoort te wees, en wat hoofsaaklik werk met gewone breuke, desimale en persentasies, maar ook fokus op gemengde getalle en repeterende desimale breuke.</i>
Bewerkings met breuke	62 / 67 / 237 / 245 / 250 / 270 / 272 4784 / 4819 / 4864 / 4897
Ekwivalensie: Breuke, Desimale en Persentasies	244 / 4305 / 4309 / 4310 / 4578 / 4607 / 4728 / 4742 / 4791
Afronding van desimale	4514 / 4833
Bewerkings met desimale breuke	71 / 72 / 204 / 4308 / 4329 / 4495
Vergelyk en rangskik desimale breuke	4311 / 4785

<b>Eksponente</b>	<i>Eksponente maak dit maklik om groot vermenigvuldigings kort te skryf, maar ten einde dit reg te gebruik is daar wette van eksponente wat onder die knie gekry moet word</i>
Wetenskaplike notasie	900
Eksponentwette	234 / 241 / 421 / 612 / 3978 / 4066
Negatiewe eksponente	1802
Werk met eksponente	80 / 83 / 212 / 4555

<b>Getalpatrone</b>	<i>Getalpatrone word tipies geskep deur 'n vaste getal elke keer by te tel of af te trek, en dan word daar na só 'n getalpatroon verwys as "lineêr". Vir die doeleindes van hierdie indeks word dit ook as lineêr beskou wanneer daar met 'n konstante getal vermenigvuldig word, maar wanneer só 'n patroon nie herken kan word nie, word dit beskou as nie-lineêr, wat ook 'n tipe patroon is waarmee die leerder moet kan werk</i>
Lineêre patrone	40
Nie-lineêre patrone	178

<b>Funksies en Verwantskappe</b>	<i>Die afdeling van getalpatrone berus onder andere ook op tabelle wat invoer- en uitvoer waardes koppel aan 'n reël (formule) en vloedigramme word oom hiermee verweef. Die ideaal is om hierdie formule-stelsels as funksies (getalmasjiene) te kategoriseer, en daarom word dit hier gelys. Die afdeling van "Funksies" in Graad 9 is egter op pad na die reguitlyn grafiek toe.</i>
Die verhouding met getalpatrone	42 / 43
Die reguitlyn grafiek	201

<b>Algebraïese uitdrukkings</b>	<i>'n Algebraïese uitdrukking word tipies geïdentifiseer deur die gebruik van alfabetiese letters wat ons veranderlikes noem. Aangesien hierdie veranderlikes in formules gebruik word verteenwoordig hulle getalle, maar moet apart van gewone getalle gehanteer word - met wette en tegnieke eie aan Algebra.</i>
Teorie	899 / 4066
Bewerkings	39 / 65
Faktorisering	187 / 681 / 684 / 4498
Algebraïese breuke	22 / 83 / 234 / 241 / 4428 / 4726 / 4839

<b>Algebraïese vergelykings</b>	<i>'n Groot deel van die rede hoekom ons Algebra doen het te doen met vergelykings - dit is baie belangrik vir die groter prentjie. Dit begin al in Graad 7 vir alle praktiese doeleindes, maar dit word stelselmatig al hoe meer kompleks in die Hoërskool jare. Vergelykings kan ook gesien word as formules en daarom word substitusie en tabelle ook in hierdie kategorie ingesluit.</i>
Lineêre vergelykings	249 / 252 / 255
Substitusie	19 / 4331 / 4333
Tabelle of vloedigramme	743 / 4367
Kwadratiese vergelykings	202
Woordsomme	4846

<b>Meetkunde</b>	<i>Meetkunde het die neiging om intimiderend te raak sodra die konsep van Bewering en Rede in Graad 8 bygevoeg word, en stelselmatig word baie meer klem gelê op die identifisering en gebruik van die toepaslike stellings.</i>
Driehoeke	165 / 168 / 4313 / 4603
Vierhoeke	4629
Bewering en Rede	215 / 4228



Driehoeke	<i>Die meetkunde van driehoeke is alreeds behandel vroeë - op hierdie punt egter fokus die kurrikulum op een spesifieke tiepe driehoek, naamlik die reghoekige driehoek, en meer spesifiek die Stelling van Pythagoras wat van toepassing is op die reghoekige driehoek.</i>
Die stelling van Pythagoras	185 / 239 / 240 / 3902 / 3998 / 4520

Meting	<i>Die opskrif van hierdie afdeling word eintlik oorgedra vanaf die Laerskool, toe die afmetings van voorwerpe nog fisies gemeet is, maar dit het nou al 'n heel ander karakter, waar die eienskappe van voorwerpe bereken moet word.</i>
Omtrek	161 / 4635 / 4669
Oppervlak en buite-oppervlak	4638 / 4881
Volume	39 / 2479 / 4476 / 4889 / 4893
Gemeng	81 / 82 / 232 / 3919 / 4031 / 4032 / 4631 / 4637 / 4639 / 4834 / 4891

Grafieke	<i>Die reguitlyn grafiek is behandel by die afdeling van funksies, maar slegs as 'n "getalmasjien". In hierdie afdeling kyk ons na ander aspekte van die grafiek.</i>
Die reguitlyn grafiek	20 / 149 / 150 / 183 / 201 / 233 / 1123 / 1295 / 1381 / 2290 / 2333 / 2397 / 2642 / 2883 / 4521 / 4575

Transformasies	<i>'n Belangrike deel van transformasies tydens vroeër jare was die bekendstelling van die koördinaat stelsel, wat eintlik die enigste gedeelte is wat deurgevat word na Graad 9, behalwe vir 'n algemene begrip van transformasies. Die verskillende komponente van Transformasies word egter in Graad 9 gekonsolideer, waar formules gebruik word om die onderskeie veranderings te beskryf.</i>
Koördinate	4080 / 4533
Translasies	4392 / 4554 / 4577
Rotasies	4392 / 4554 / 4577
Vergroting en verkleining	4554 / 4577
Refleksies	4392 4554

Data	<i>Statistiek is 'n baie breë onderwerp, en dit word geleidelik al hoe meer kompleks met elke akademiese jaar. Dit kan egter in drie dele onderverdeel word, naamlik Sentrale neiging (modus, mediaan en gemiddeld), Sentrale verspreiding (reikwydte) en Verslagdoening (al die grafieke)</i>
Sentrale neiging	230 / 3999 / 4000 / 4793

Grafieke	58 / 142 / 156 / 157 / 158 / 3407 / 3995 / 4028 / 4078 / 4405 / 4438 / 4440 / 4441 / 4442 / 4556 / 4633 / 4790 / 4868 / 4871
Waarskynlikheid	<i>Waarskynlikheid is 'n baie komplekse dissipline in Wiskunde, en moet ingebring word in stappe met elke akademiese jaar. In Graad 9 word een só 'n stap vorentoe gemaak.</i>
Boomdiagramme	1719 / 1720 / 2850 / 4657
Relatiewe frekwensie	4083