Mathematics Challenge

GRADE 6 FINAL ROUND
12 OCTOBER 2004

NOTE:

- Answer the questions according to the instructions on the answer sheet.
- You may use a calculator.
- The questions test insight. Complex calculations are therefore unnecessary and time consuming.
- We hope you enjoy it!

1. Today, 12 October 2004, falls on a Tuesday. On what day of the week will 12 October 2012 fall?

(A) Wednesday / Woensdag / Thathu
(B) Tuesday / Dinsdag / Lwesibini
(C) Friday / Vrydag / Lwesihlanu
(D) Saturday / Saterdag / Mgqibelo
(E) Sunday / Sondag / Cawa

2. What number is exactly halfway between 5,6 and 5,65?

(A) 5,025
(B) 5,625
(C) $5{,}62\frac{1}{2}$
(D) 5,605
(E) 5,655

3. Which one of these is *not* true?

(A) $(1 + 1) \div (1 + 1) = 1$
(B) $2 \div 2 + 2 \div 2 = 2$
(C) $3 \times 3 - 3 + 3 = 3$
(D) $(4 - 4) \div 4 + 4 = 4$
(E) $5 + 5 \times (5 - 5) = 5$

Wiskunde-uitdaging

GRAAD 6 FINALE RONDE
12 OKTOBER 2004

LET OP:

- Beantwoord die vrae volgens die instruksies op die antwoordblad.
- Jy mag ’n sakrekenaar gebruik.
- Die vrae toets insig. Omslagtige berekeninge is dus onnodig en tydrowend.
- Ons hoop jy geniet dit!

1. Vandag, 12 Oktober 2004, val op ’n Dinsdag. Op watter dag van die week sal 12 Oktober 2012 val?

2. Watter getal is presies halfpad tussen 5,6 en 5,65?

3. Watter een hiervan is *nie* waar nie?

Umceli-mngeni Ngezibalo

GRADE 6 UMJIKELO WOKUGQIBELA
12 OKTHOBHA 2004

QAPHELA:

- Phendula imibuzo ngokwemigaqo ekwiphepha olinikiweyo.
- Ungayisebenzisa i-Calculator.
- Imibuzo ivavanya ukuqonda kwakho. Izibalo ezide, ezixhakaxhaka aziyomfuneko.
- Siyathemba uyakulonwabela!

1. Namhlanje, ama 12 Oktobha 2004, aya kuba ngolweSibini. Uyakuba koluphi usuku lweveki umhla wama 12 Oktobha 2012?

2. Leliphi elona nani liphakathi kanye kwesi 5,6 nesi 5,65?

3. Ingaba yeyiphi kwezi engeyonyani?

Western Cape
Wes-Kaap
Ntshona-Koloni
AMESA
The Association for Mathematics Education of South Africa

In cooperation with the
Western Cape Education Department
Gauteng Education Department

Nasou Via Afrika

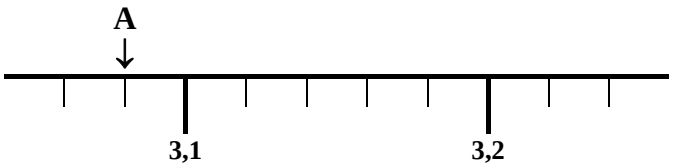
CASIO

RUMEUS
Research Unit for Mathematics Education of the University of Stellenbosch

4. What is the number indicated by A on the ruler?

4. Wat is die getal aangedui deur A op die liniaal?

4. Leliphi inani eliboniswa ngu A ?



(A) 2,08 (B) 2,8 (C) 3,0 (D) 3,08 (E) 3,09

5. A lorry with a load of maize has a mass of 4 653 kg. The mass of the empty lorry is 2 583 kg. One bag of maize has a mass of 90 kg. How many bags of maize are on the lorry?

5. ’n Vragmotor met ’n vrag mielies het ’n massa van 4 653 kg. Die massa van die leë vragmotor is 2 583 kg en een sak mielies het ’n massa van 90 kg. Hoeveel sakke mielies is daar op die vragmotor?

5. I lori enomthwalo wengqolowa inobunzima obungama 4653 kg. Ubunzima belori engenamthwalo bungama 2 583 kg. Ingxowa nganye yengqolowa inobunzima obungama 90 kg. Zingaphi iingxowa zengqolowa ezikule lori?

(A) 20 (B) 21 (C) 22 (D) 23 (E) 24

6. Which of the following divisions has the smallest remainder?

6. Watter van die volgende deelprobleme het die kleinste res?

6. Ingaba yeyiphi kwezi eneyona ntsalela incinci?

(A) $4002 \div 4$ (B) $503 \div 5$ (C) $604 \div 6$ (D) $75 \div 7$ (E) $8883 \div 8$

7. Which fraction is between $\frac{5}{6}$ and $\frac{7}{8}$?

7. Watter breuk is tussen $\frac{5}{6}$ en $\frac{7}{8}$?

7. Leliphi kula maqhezu eliphakathi ko $\frac{5}{6}$ kunye $\frac{7}{8}$?

(A) $\frac{4}{5}$ (B) $\frac{18}{22}$ (C) $\frac{41}{48}$ (D) $\frac{8}{9}$ (E) $\frac{5}{7}$

8. A magic substance is placed in a container, where it doubles in quantity every minute. If the container is full after one hour, after how many minutes was it half-full?

8. ’n Towerstof word in ’n houer geplaas en verdubbel elke minuut in hoeveelheid. As die houer na een uur vol was, na hoeveel minute was die houer half-vol?

8. Umgubo othile wobugqi ofakwe kwisingxobo, uthi uziphinde kabini ngobukhulu rhoqo emva komzuzu. Ukuba esi singxobo sathi sazaliswa ngulo mgubo emva kweyure enye, kusemva kwemizuzu emingaphi apho lo mgubo uthe waba wasehafini yobukhulu besi singxobo?

(A) 30 (B) 59 (C) 15 (D) 2 (E) 0,5

9. Which of these fractions is the largest?4

9. Watter van hierdie breuke is die grootste?

9. Ingaba kula maqhezu leliphi elona likhulu?

(A) $\frac{7}{15}$ (B) $\frac{8}{17}$ (C) $\frac{11}{23}$ (D) $\frac{13}{27}$ (E) $\frac{5}{11}$

10. A book and a CD together cost R230. If the CD costs R60 more than the book, how much does the book cost?

(A) R80 (B) R115 (C) R110 (D) R170 (E) R85

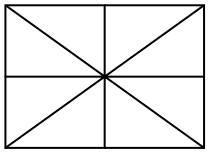
10. ’n Boek en ’n CD saam kos R230. As die CD R60 meer kos as die boek, hoeveel kos die boek?

10. Incwadi kunye ne CD zizombini zixabisa ama R230. Ukuba I CD ixabisa ama R60 ngaphezu kwencwadi, ingaba incwadi ixabisa malini?

11. How many different triangles are there in this figure?

(A) 10 (B) 12 (C) 14 (D) 16 (E) 8

11. Hoeveel verskillende driehoeke is daar in hierdie figuur?

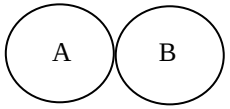


11. Bangaphi oonxantathu abangalinganiyo abakhoyo kulo mzobo?

12. A and B are two circles of the same size. If A is fixed and B is rolled around A, how many revolutions will B make before returning to its original position?

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

12. A en B is twee ewe-groot sirkels. As A vas is en B word rondom A gerol, hoeveel omwentelings sal B maak voordat dit weer op die oorspronklike posisie is?



12. Imizobo u A kunye no B zizangqa ezinedayametha efanayo. Ukuba u A uye wacinezelwa waza u B waqengwa ejikeleziswa kwisangqa sika A, uya kuqengwa kangaphi ngokupheleleyo u B phambi kokuba abuyele kwindawo abe ekuyo ekuqaleni?

13. In rugby a team can score as follows:

A try counts 5 points
A conversion after a try counts 2 points
A penalty or a drop goal counts 3 points.

So, a team cannot have a score of 1, 2 or 4 points. Which of these scores is not possible in rugby?

(A) 43 (B) 78 (C) 56 (D) 47

13. In rugby kan ’n span die volgende punte aanteken:

’n Drie tel 5 punte
’n Doelskop na ’n drie tel 2 punte
’n Strafskop of ’n skepskop tel 3 punte.
Dus kan ’n span nie ’n telling van 1, 2 of 4 punte hê nie.

Watter van die hierdie tellings is onmoontlik in rugby?

13. Kumdlalo wombhoxo iqela lingafumana amanqaku ngolu hlobo: Ngokulala emgceni lifumana amanqaku ama 5. Ngokufaka ibhola ezimpondweni emva kokulala emgceni lifumana amanqaku ama 2. Ngokufaka ibhola ezimpondweni emva kwesohlwayo okanye uyifake ngokuyikhaba xa ubona ithuba lifanele lifumana amanqaku ama 3. Ke ngoko iqela alikwazi ukufumana inqaku eli 1, okanye ama 2, okanye ama 4. Leliphi kula manqaku elingasoze libe linqaku elinokuphunyelelwa kumdlalo wombhoxo?

(E) All are possible / Almal is moontlik / Oonke anako ukuphunyelelwa

14. Jane eats twice as many sweets as Sue in half the time. Sue eats 12 sweets in 10 minutes. How many sweets does Jane eat in the same time?

(A) 60 (B) 12 (C) 48 (D) 24 (E) 60

14. Jane eet twee keer soveel lekkers as Sue in helfte van die tyd. Sue eet 12 lekkers in 10 minute. Hoeveel lekkers eet Jane in dieselfde tyd?

14. Kwisiqingatha sethuba uJane unokutya iilekese ezimbini ezinokutyiwa ngu Sue. U Sue uthi atye iilekese ezili 12 kwisithuba esingange 10 lemizuzu. Zingaphi iilekese ezinokutyiwa ngu Jane ngemizuzu elishumi?

15. Jackie interviewed fifty 6th graders about their TV preferences. 41 said they like comedy, 35 said they enjoy action films and 30 said they like both. How many of the learners like neither?

(A) 11 (B) 20 (C) 0 (D) 4 (E) 9

15. Jackie het vyftig graad 6-leerders ondervra oor hul TV voorkeure. 41 sê hulle hou van komedies, 35 sê hulle geniet aksieflieks en 30 sê hulle hou van beide. Hoeveel van die leerders hou nie van een van die twee nie?

15. U Jackie wathi wenza udliwano ndlebe nabafundi bebanga lesithandathu abangashumi amahlanu ebabuza ngenkqubo zikamabonakude abazithandayo. Abangama 41 bathi bathanda inkqubo ezihlekisayo, abangama 35 bathi bonwatyiswa zinkqubo apho kuliwayo kuzo baze abangama 30 bona bathi bazithanda zombini ezindidi zenkqubo. Bangaphi abafundi ekungekho nenye kwezindidi zenkqubo abayithandayo?

16. From a batch of 3 000 light bulbs a sample of 100 were randomly selected and tested. If five of the light bulbs in the sample were found to be defective, about how many defective light bulbs would be expected in the entire batch?

(A) 60 (B) 150 (C) 300 (D) 600 (E) One cannot say / Onmoontlik om te sê / Asinakukwazi kakuhle ukuchaza

16. In ’n besending van 3 000 gloeilampe is ’n monster van 100 willekeurig gekies en getoets. As vyf van die gloeilampe foutief was, hoeveel foutiewe gloeilampe kan ’n mens in die hele besending verwag?

16. Kuma 3 000 ezibane zombane kwakhethwa i 100 laza lavavanywa. Ukuba isi 5 sezibane kwezi zikhethiweyo kwafunyaniswa lineziphene, zingangaphi izibane ezineziphene ezingafunyanwayo xa zizonke ezi zibane?

17. Thirty equally spaced points on a circle are labelled in order with the numbers 1 to 30. Which number is directly opposite to 7?

(A) 21 (B) 22 (C) 23 (D) 24 (E) 20

17. Dertig punte op ’n sirkel, almal ewe ver van mekaar, word opeenvolgend genommer van 1 tot 30. Watter getal is presies oorkant 7?

17. Amachokoza angama 30 abekwe akwimiganyana elinganayo kwisangqa aze abhalwa elandelelaniswa ngamanani isi 1 ukuya kuma 30. Leliphi inani elijongene ngqo nesi 7 likumgca wombindi wesangqa?

18. The table represents the relationship between *x* and *y*. What is the missing number in the table?

18. Die tabel stel die verband tussen *x* en *y* voor. Wat is die ontbrekende getal in die tabel?

18. Le tafile ibonisa ukuzalana okukhoyo phakathi ko *x* kunye no *y*. Lingubani inani elingachazwanga kule tafile?

x	*y*
2	3
3	5
4	?
6	17

(A) 6 (B) 7 (C) 8 (D) 9 (E) 10

19. You must "guess" my secret number, which is a whole number between 1 and 4, both inclusive. You tell me your guess and I will tell you if your guess is too small, correct or too big, and I will not lie! What is the smallest number of guesses needed to get my number?

19. Ek het 'n geheime getal tussen 1 en 4, albei ingesluit. Jy moet my geheime getal "raai". Jy sê my wat jy raai, en ek sal jou sê of jou raaiskoot te klein, korrek of te groot is, en ek sak nie jok nie! Wat is die kleinste getal raaiskote wat jy nodig het om my getal te vind?

19. Qashisela(guess) inani lam eliyimfihlo , eliyinombolo ephakathi kuka 1 no 4, kungenzeka eli nani lilingane no 1 okanye no 4. Ndixelele inani elo ndizakukuxelela ukuba likhulu na nokuba lincinane kunenani elililo kwaye andisayi kukuxokisa. Leliphi elona nani lincinane elifunekayo ukuze ufumanise eli nani ndikufihlele lona? Khetha impendulo yakho kwezi uzinikiweyo ku-A ukuya ku-E. Qaphela inye kuphela impendulo elungileyo?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

20. In the previous question, if my secret number is a whole number between 1 and 16, both inclusive, what is the smallest number of "guesses" needed to get my number?

20. In die vorige vraag, as my geheime getal tussen 1 en 16 is, albei ingesluit, wat is die kleinste getal raaiskote wat jy nodig het om my getal te vind?

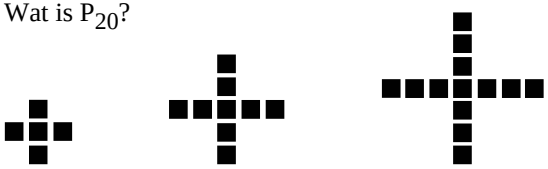
20. Kumbuzo ongasentla, ukuba inani elifihlakeleyo liphakathi kuka-1 no-16, bobabini befakiwe, leliphi elona nani lincinane elifanelekileyo? Khetha kwezi mpendulo uzinikiweyo?

(A) 5 (B) 6 (C) 7 (D) 8 (E) 9

21. Study the following pattern.
What is P_{20}?

21. Bestudeer die volgende patroon.
Wat is P_{20}?

21. Funda ola luhlu lulandelayo.
Sithini isiphumo sika P_{20}?



$P_1 = 5$ $P_2 = 9$ $P_3 = 13$

(A) 77 (B) 79 (C) 80 (D) 81 (E) 83

22. A palindrome is a whole number that reads the same forwards or backwards (e.g. 4774). How many palindromes are there between 10 and 500?

(A) 40 (B) 49 (C) 45 (D) 36 (E) None of these

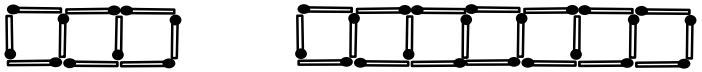
22. ’n Palindroom is ’n getal wat dieselfde lees van links en van regs (bv. 4774). Hoeveel palindrome is daar tussen 10 en 500?

(A) 40 (B) 49 (C) 45 (D) 36 (E) Nie een hiervan nie

22. I Palindrome linani elizeleyo elifundeka ngokufanayo xa uliqala ngaphambili naxa uluqala ngasemva (umzekelo 4774). Zingaphi ii palindrome ezikhoyo phakathi kwe 10 nama 500?

(A) 40 (B) 49 (C) 45 (D) 36 (E) Ayiko kwezi

23. John builds squares as shown. When there are 3 squares, there are 10 matches. When there are 7 squares, there are 22 matches. How many matches does he need to make 20 such squares?



(A) 61 (B) 60 (C) 65 (D) 64 (E) 63

23. John bou vierkante soos getoon. Vir 3 vierkante gebruik hy 10 vuurhoutjies en vir 7 vierkante 22 vuurhoutjies. Hoeveel vuurhoutjies gebruik hy vir 20 sulke vierkante?

(A) 61 (B) 60 (C) 65 (D) 64 (E) 63

23. UJona wenza izikweri(squares) njengoko ubonisiweyo. Xa izikweri(squares) zintathu, usebenzisa izinti ezili-10. Xa izikweri zisi-7, kusebenza izinti ezingama-22. Zingaphi izinti ekwakhiwa ngazo izikweri(squares) ezingama-20? Nika impendulo yakho apha.

(A) 61 (B) 60 (C) 65 (D) 64 (E) 63

24. In question 23, if John has 223 matches, how many such squares can he build if he uses all the matches?

(A) 70 (B) 72 (C) 74 (D) 76 (E) 78

24. In vraag 23: as John 223 vuurhoutjies het, hoeveel sulke vierkante kan hy bou as hy al die vuurhoutjies gebruik?

(A) 70 (B) 72 (C) 74 (D) 76 (E) 78

24. Xa ngaba kumbuzo-23 uJona unezinti ezili-223, zingaphi izikweri(squares). Anokuzakha xa esebenzisa zonke izinti, uJona? Yiza nempendulo yakho apha.

(A) 70 (B) 72 (C) 74 (D) 76 (E) 78

25. Refer to question 23. John built many different squares. Which of the numbers below *cannot* be the number of matches he used?

(A) 361 (B) 451 (C) 631 (D) 811 (E) 821

25. Verwys na vraag 23: John het baie verskillende groottes vierkante gebou. Watter van die volgende kan nie die getal vuurhoutjies wees wat hy gebruik het nie?

(A) 361 (B) 451 (C) 631 (D) 811 (E) 821

25. Ngokubhekiselele kumbuzo-23 , xa uJona esakha izikweri(squares) ezininzi, leliphi inani lezinti elingeke lisebenze nokuba sekunjani? Cingisisa, ukhethe kwezi mpendulo uzinikiweyo?

(A) 361 (B) 451 (C) 631 (D) 811 (E) 821