Mathematics Challenge

GRADE 7 FIRST ROUND
SEPTEMBER 2003

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!

Wiskunde-uitdaging

GRAAD 7 EERSTE RONDE
SEPTEMBER 2003

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!

Umceli-mngeni Ngezibalo

GRADE 7 UMJIKELO WOKUQALA
SEPTEMBA 2003

QAPHELA:

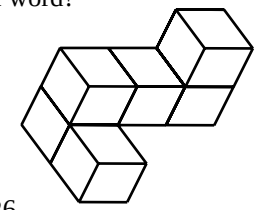
- Phendula imibuzo ngokwemigaqo ekwiphepha olinikiweyo.
- Ungayisebenzisa i-Calculator.
- Imibuzo ivavanya ukuqonda kwakho. Izibalo ezide, ezixhakaxhaka aziyomfuneko.
- Siyathemba uyakulonwabela!

---

1. The object below is made by gluing together six wooden cubes.
   If you want to paint the object, how many sides (faces) must be painted?

   (A) 30 (B) 27 (C) 26 (D) 25 (E) 24

1. Die voorwerp hieronder word gemaak deur ses houtblokkies aan mekaar te lym.
   As jy die voorwerp verf, hoeveel kante (aangesigte) moet geverf word?



1. Esi sakhiwo singezantsi senziwe ngokuthi kuncanyatheliswe iityhubhu ezintandathu ezenziwe ngokhuni Ukuba ufuna ukusipeyinta esi sakhiwo zingaphi iindonga zaso ekufuneka ziipeyintiwe?

---

2. An article costs R36,15. This price includes Value Added Tax (VAT) of 14 %. What does the article cost without VAT?

   (A) R31,08 (B) R31,09 (C) R31,72 (D) R31,71 (E) R31,07

2. ’n Artikel kos R36,15. Hierdie prys sluit Belasting op Toegevoegde Waarde (BTW) van 14% in. Hoeveel kos die artikel sonder BTW?

2. Ixabiso le mpahla liyi-R36,15 lidityaniswe nentela yentengo (VAT) eyi-14%. Ibiza malin le.mphala ngaphandle kwentela yentengo VAT?

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

3. The average mass of 3 boys is 75 kg. The average mass of 6 girls is 66 kg. What is the average mass of the 9 children together?

(A) 70,5 kg (B) 68 kg (C) 70 kg (D) 69 kg (E) 69,5 kg

3. Die gemiddelde massa van 3 seuns is 75 kg. Die gemiddelde massa van 6 meisies is 66 kg. Wat is die gemiddelde massa van die 9 kinders saam?

3. Umyinge (average) wobunzima bamakhwenkwe ama 3 bungama 75 kg. Umyinge wobunzima bamantombaza ama 6 bungama 66 kg. Ingaba umyinge wobunzima bababantwana bali 9 bebonke ungakanani?

4. What is the value of a in the table?

4. Wat is die waarde van a in die tabel?

1	2	3	4	…	*a*
4	6	8	10	…	64

4. Liyintoni ixabiso lika a kule theyibhile?

(A) 31 (B) 16 (C) 5 (D) 57 (E) 34

5. Vasco da Gama was born in 1460 and died in 1524. How old was he when he died?

(A) 63 (B) 64 (C) 65 (D) 66 (E) Not enough information / Nie genoeg inligting nie / Inkcazelo ayanelanga

5. Vasco de Gama is gebore in 1460 en is oorlede in 1524. Hoe oud was hy toe hy oorlede is?

5. U Vasco da Gama wazalwa ngomyaka we 1460 waza wafa ngowe 1524, Wayemdala kangakanani ukufa kwakhe?

6. A rectangular room is p metres long and q metres wide. Which of the following formulas cannot be used to determine the perimeter of the room?

(A) $p + p + q + q$ (B) $2 \times p + 2 \times q$ (C) $(p + q) \times 2$ (D) $p \times q + p \times q$ (E) $p + q + p + q$

6. ’n Reghoekige kamer is p meter lank en q meter breed. Watter van die volgende formules kan nie gebruik word om die omtrek van die kamer te bereken nie?

6. Igumbi lizimitha ezingama p ubude luze lube zimitha ezingama q ububanzi. Kwezi zilandelayo yeyiphi engenakusetyenziswa ukubala ubude bomphandle (perimeter) wegumbi?

7. The length of a rectangle is four times as long as its width. The area of the rectangle is 100 m^2. What is the perimeter of the rectangle?

(A) 50 m (B) 25 m (C) 20 m (D) 15 cm (E) 60 m

7. Die lengte van ’n reghoek is vier keer so lank as sy breedte. Die oppervlakte van die reghoek is 100 m^2. Wat is die omtrek van die reghoek?

7. Ubude boxande bubuphindaphinda kane ububanzi balo. I area yolu xande ili 100 m^2. Ingaba bungakanani ubude bokudityaniswa kwamacala?

8. The answer of $n \div 6{,}34$ is a.
What is the answer of $n \div 634$?

(A) a (B) $100 \times a$ (C) $a \div 100$ (D) $10 \times a$ (E) None of these / Nie een hiervan nie / Ayikho kwezi

8. Die antwoord van $n \div 6{,}34$ is a.
Wat is die antwoord van $n \div 634$?

8. Isiphumo sika $n \div 6{,}34$ ngu a.
Ngubani isiphumo sika $n \div 634$?

9. How many numbers between 1 and 100 satisfy all the following conditions?
If it is divided by 3 the remainder is 1
If it is divided by 5 the remainder is 1
If it is divided by 7, the remainder is 0

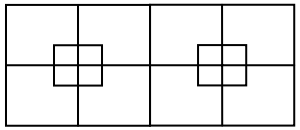
(A) 1 (B) 0 (C) 6 (D) 14 (E) None of these / Nie een hiervan nie / Ayiko kwezi

9. Hoeveel getalle tussen 1 en 100 voldoen aan al die volgende vereistes?
As die getal deur 3 gedeel word is die res 1
As die getal deur 5 gedeel word is die res 1
As die getal deur 7 gedeel word is die res 0

9. Mangaphi amanani aphakathi kwe 1 ne 100 athobela le mimiselo ilandelayo?
Ukuba lohlulwe ngesi 3 intsalela iba sisi 1
Ukuba lohlulwe ngesi 5 intsalela iba sisi 1
Ukuba lohlulwe ngesi 7 intsalela iba li 0

10. How many squares (of all sizes) are there in this diagram?

10. Hoeveel vierkante (van alle groottes) is daar in hierdie diagram?

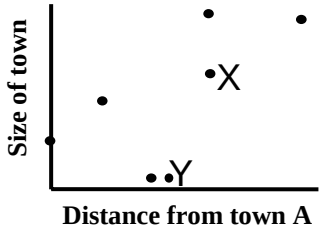


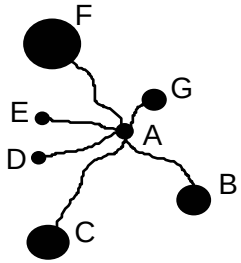
10. Zingaphi izikwere (zabo bonke ubukhulu) ezifumanekayo kulo mzobo?

(A) 16 (B) 17 (C) 20 (D) 21 (E) 22

11. The graph and map below show the size of five towns and their distances from town A. Which town on the map corresponds to the town marked X in the graph?

11. Die grafiek en kaart hieroner toon die grootte van vyf dorpe en die afstand vanaf dorp A. Watter dorp op die kaart stem ooreen met die dorp gemerk X in die grafiek?





11. Le grafu nale mephu zingezantsi zibonisa ubukhulu beedolophu ezintlanu nomgama wazo ukusuka kwidolophu u A. Yeyiphi idolophu kwi mephu ekwayidolophu ekwichokoza elibhalwe X kwi grafu?

(A) A (B) B (C) C (D) D (E) E

12. In question 11, which town on the map corresponds to the town marked Y in the graph?

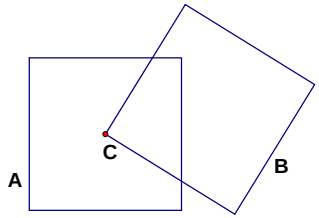
12. In vraag 11, watter dorp op die kaart stem ooreen met die dorp gemerk Y in die grafiek?

12. Kumbuzo 11, yeyiphi idolophu kwi mephu ekwayidolophu ekwichokoza elibhalwe Y kwi grafu?

(A) A (B) B (C) D (D) E (E) F

13. Squares A and B are identical 12 cm by 12 cm squares. One corner of B is at the centre of A. What area is shaded?

13. Vierkante A en B is identiese 12 cm by 12 cm vierkante. Een hoek van B is A se middelpunt. Watter oppervlakte is verdonker?

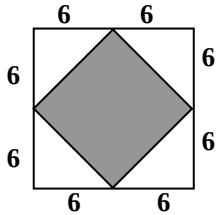


13. Izikwere u A kunye no B ziyafana kwaye zilinganiswa nge 12 cm by 12 cm sisinye. Enye yekona zika B ihleli kwichaphaza elilelona lisembindini ka A. Bungakanani ubukhulu be area eyenziwe mnyama?

(A) 30 cm^2 (B) 32 cm^2 (C) 34 cm^2 (D) 36 cm^2 (E) Not enough information / Nie genoeg inligting nie / Inkcazelo ayanelanga

14. The outside figure below is a 12 cm by 12 cm square. What is the area of the shaded square?

14. Die buitenste figuur hieronder is ’n 12 cm by 12 cm vierkant. Wat is die oppervlakte van die verdonkerde vierkant?

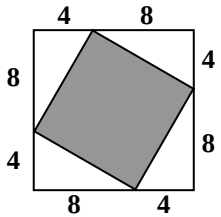


14. Lo mzobo ungezantsi ususikwere esilinganiswa nge 12 cm by 12 cm. Bungakanani ubukhulu be area yesikwere eyenziwe mnyama?

(A) 62 cm^2 (B) 64 cm^2 (C) 72 cm^2 (D) 80 cm^2 (E) None of these / Nie een hiervan nie / Ayiko kwezi

15. The outside figure below is a 12 cm by 12 cm square. What is the area of the shaded square?

15. Die buitenste figuur hieronder is ’n 12 cm by 12 cm vierkant. Wat is die oppervlakte van die verdonkerde vierkant?



15. Lo mzobo ungezantsi ususikwere esilinganiswa nge 12 cm by 12 cm. Bungakanani ubukhulu be area yesikwere eyenziwe mnyama?

(A) 62 cm^2 (B) 64 cm^2 (C) 72 cm^2 (D) 80 cm^2 (E) None of these / Nie een hiervan nie / Ayiko kwezi

16. Ali, Eli, Oli and Uli are friends. They are all different ages. They are 5, 6, 7 and 8 years old.
Oli's age is an even number
Uli is not the youngest
Uli and Eli's ages are both odd numbers

How old is Eli?

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

16. Ali, Eli, Oli en Uli is vriende. Hulle is almal verskillende ouderdomme. Hulle is 5, 6, 7 en 8 jaar oud.
Oli se ouderdom is ’n ewe getal
Uli is nie die jongste nie
Uli en Eli se ouderdommeis beide onewe getalle

Hoe oud is Eli?

16. U Ali , u Eli , u Oli kunye no Uli bangabangane. Bonke baneminyaka yobudala engalinganiyo. Baneminyaka yobudala esi 5, isi 6, isi 7 kunye nesi 8. Ubudala buka Oli bulinani eli even. U Uli akangoyena mncinane. Iminyaka yobudala ka Uli no Eli ingamanani ayiminqakathi. Mdala kanganani u Eli?

(E) Not enough information / Nie genoeg inligting nie / Inkcazelo ayanelanga

17. Refer to the previous question. How old is Ali?

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

17. Verwys na die vorige vraag. Hoe oud is Ali?

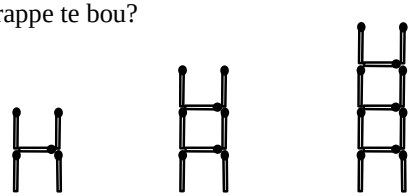
17. Jonga kumbuzo ongentla. Mdala kangakanani u Ali?

(E) Not enough information / Nie genoeg inligting nie / Inkcazelo ayanelanga

18. Sipho builds ladders with matches as shown below. How many matches will he need to build a ladder with 15 steps?

(A) 47 (B) 45

18. Sipho bou lere met vuurhoutjies soos hieronder. Hoeveel vuurhoutjies sal hy nodig hê om ’n leer met 15 trappe te bou?



1 step	2 steps	3 steps
1 trap	2 trappe	3 trappe
1 inyathelo	2 amanyathelo	3 amanyathelo

(C) 44 (D) 50

18. U Sipho wakha ii leri ngemicinga njengokuba kubonisiwe ngezantsi. Mingaphi imicinga anokuyisebenzisa ukwakha ileri enamanyathelo ali 15?

(E) 49

19. Peter, Melanie, April and Jack received a total of 38 chocolate eggs.

Jack had one less than Peter
Peter had 5 less than Melanie
Peter had 2 more than April

How many eggs did April have?

(A) 14 (B) 9 (C) 8 (D) 10

19. Peter, Melanie, April en Jack ontvang altesaam 38 sjokolade eiers.

Jack het een minder as Peter
Peter het 5 minder as Melanie
Peter het 2 meer as April

Hoeveel eiers het April?

19. U Peter, u Melanie, u April kunye no Jack bafumana bebonke iamaqanda angama 38 enziwe nge tshokoleti.

U Jack wayengaphantsi ngelinye kwawaka Peter
U Peter wayengaphantsi ngama 5 kwawaka Melanie
U Peter wayengaphezulu ngama 2 kwawaka Apri

Ayemangaphi amaqanda ka April?

(E) 7

20. Larry bought a total of 32 apples and oranges for R52. An apple costs R2 and an orange costs R1. How many apples did he buy?

(A) 12 (B) 16

20. Larry koop altesaam 32 appels en lemoene vir R52. ’n Appel kos R2 en ’n lemoen kos R1. Hoeveel appels het hy gekoop?

(C) 20 (D) 22

20. U Larry wathenga ama apile ama orenji angama 32 ngama R52. I apile ngalinye lixabisa iiR2 lize lona i orenji ngalinye lixabise i R1. Mangaphi ama apile awawathengayo?

(E) 24

21. $5^2 = 5 \times 5$
$5^3 = 5 \times 5 \times 5$
$5^4 = 5 \times 5 \times 5 \times 5$
What is the answer of $5^{14} \div 5^{17}$?

(A) $\frac{1}{25}$ (B) $\frac{1}{125}$

21. $5^2 = 5 \times 5$
$5^3 = 5 \times 5 \times 5$
$5^4 = 5 \times 5 \times 5 \times 5$
Wat is die antwoord van of $5^{14} \div 5^{17}$?

(C) $\frac{1}{15}$ (D) 25

21. $5^2 = 5 \times 5$
$5^3 = 5 \times 5 \times 5$
$5^4 = 5 \times 5 \times 5 \times 5$
Sithi isiphumo sesi of $5^{14} \div 5^{17}$?

(E) 125

22. $3^4 = 3 \times 3 \times 3 \times 3 = 81$, so 3^4 ends on a 1. On what digit does 3^{2003} end?

(A) 1 (B) 3

22. $3^4 = 3 \times 3 \times 3 \times 3 = 81$, dus eindig 3^4 op ’n 1. Op watter syfer eindig 3^{2003}?

(C) 4 (D) 7

22. $3^4 = 3 \times 3 \times 3 \times 3 = 81$, ngoko ke u-$3^4$ uphela ngo-1. Ingaba u-3^{2003} yena uphela ngeliphi inani?

(E) 9

23. If the pattern below is continued, find the 10th fraction in this sequence:

$$\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+\ldots$$

(A) $\frac{1}{60}$ (B) $\frac{1}{90}$

23. As die patroon hieronder voortgesit word, vind die 10de breuk in die ry:

$$\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+\ldots$$

(C) $\frac{1}{100}$ (D) $\frac{1}{110}$

23. Ukuba olu luhlu lungezantsi luyalandelwa, luyakube lingubani iqhezu elihleli kwindawo ye 10?

$$\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+\ldots$$

(E) $\frac{1}{80}$

24. In question 23, find the sum of these 10 fractions.

(A) $\frac{10}{11}$ (B) $\frac{9}{10}$

24. In vraag 23, vind die som van hierdie 10 breuke.

(C) $\frac{109}{110}$ (D) $\frac{29}{30}$

24. Kumbuzo 23, bala isiphumo sokudityaniswa kwamaqhezu ali 10.

(E) $\frac{53}{60}$

25. Study the pattern shown below. What is the product of the numbers?

$$(1+1)\times(1+\frac{1}{2})\times(1+\frac{1}{3})\times(1+\frac{1}{4})\times(1+\frac{1}{5})\times\ \ldots\times(1+\frac{1}{100})$$

(A) $\frac{99}{100}$ (B) $\frac{101}{100}$

25. Bestudeer die patroon hieronder. Wat is die produk van die getalle?

$$(1+1)\times(1+\frac{1}{2})\times(1+\frac{1}{3})\times(1+\frac{1}{4})\times(1+\frac{1}{5})\times\ \ldots\times(1+\frac{1}{100})$$

(C) $\frac{1}{100}$ (D) 100

25. Funda olu luhlu lubonisiweyo ngezantsi. Sithini isiphumo sokuphindaphindwa kwala manani?

$$(1+1)\times(1+\frac{1}{2})\times(1+\frac{1}{3})\times(1+\frac{1}{4})\times(1+\frac{1}{5})\times\ \ldots\times(1+\frac{1}{100})$$

(E) 101