

Mathematics Challenge

GRADE 7 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 will therefore not be necessary.
- We hope you enjoy it!

1. The sketch shows eight lolly sticks. If you must pick up the top one each time, in what order will you pick them up?

(A) 7; 6; 4; 1; 8; 2; 3; 5

(B) 7; 6; 5; 4; 8; 1; 2; 3

(C) 7; 1; 6; 4; 5; 2; 8; 3

(D) 7; 1; 4; 5; 6; 2; 8; 3

(E) 7; 1; 6; 2; 4; 5; 8; 3



In cooperation with the
Western Cape Education Department
Gauteng Education Department

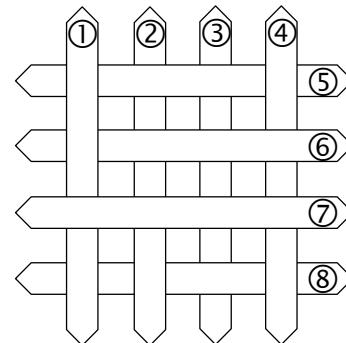
Wiskunde-uitdaging

GRAAD 7 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. Die skets toon agt roomsstokkies. As jy elke keer die boonste een moet optel, in watter volgorde sal jy hulle optel?



Umceli-mnjeni Ngezibalo

GRADE 7 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. Nazi ii-'lolly sticks' ezsibhozo. Kufuneka uthabathe engaphezulu kanye ngexesha. Yeyiphi eyona ndlela ekumele uzithabathe ngayo?

Nasou Via Afrika



CASIO

RUMEUS

Research Unit for Mathematics Education
of the University of Stellenbosch

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

(A) $4 \div 4 \times 4 \div 4 = 1$

(B) $4 + 4 \div 4 - 4 = 1$

(C) $4 \div 4 - 4 + 4 = 1$

(D) $(4 + 4) \div (4 + 4) = 1$

(E) $4 + 4 - 4 \div 4 = 1$

3. What fraction of the whole figure is shaded?

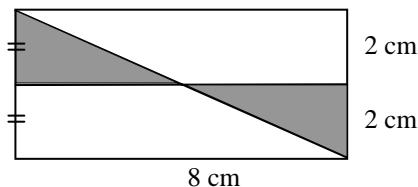
(A) $\frac{3}{10}$

(B) $\frac{1}{2}$

(C) $\frac{1}{4}$

(D) $\frac{1}{3}$

(E) $\frac{2}{5}$



4. What fraction of the whole figure is shaded?

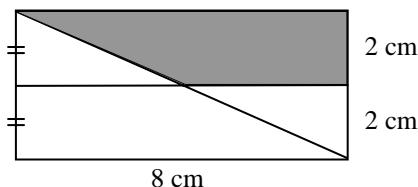
(A) $\frac{3}{10}$

(B) $\frac{3}{8}$

(C) $\frac{1}{4}$

(D) $\frac{1}{3}$

(E) $\frac{3}{4}$



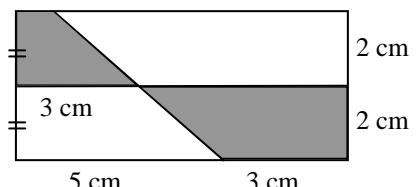
5. What area is shaded in this figure?

(A) 16 cm^2

(B) 12 cm^2

(C) 10 cm^2

(D) 8 cm^2

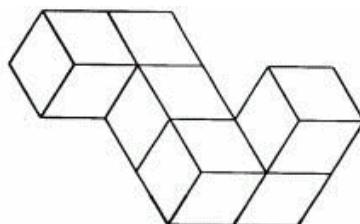


(E) Not enough information
Te min inligting
Ingxelo enikiwego ayonelanga

6. What is the surface (outside) area of this solid figure if the cubes each measure 1 cm on each side?

(A) 25 cm^2

(B) 26 cm^2



(C) 27 cm^2

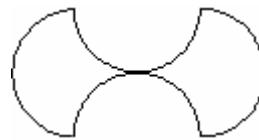
(D) 28 cm^2

(E) 29 cm^2

7. The figure is a combination of four semi-circles, each with a radius of 4 cm. What is the area of the figure?

(A) 64 cm^2

(B) 16 cm^2



(C) 36 cm^2

(D) 56 cm^2

None of these
(E) Nie een hiervan nie
Ayiko kwezi

8. I multiplied two consecutive numbers (e.g. 4 and 5) on my calculator and got the answer 702. What is the sum of the two numbers?

(A) 42

(B) 49

(C) 53

(D) 65

9. Which of these fractions is the largest?

(A) $\frac{7}{15}$

(B) $\frac{3}{7}$

(C) $\frac{6}{13}$

(D) $\frac{4}{9}$

(E) $\frac{5}{11}$

6. Wat is die buite-oppervlakte van hierdie soliede figuur as die kubusse elk 'n sylengte van 1 cm het?

6. Ingaba i area yokuphangalala komphandle walo mzobo ingakanani ukuba ityhubhu (ibhokisi emacala ma 6) nganye ilinganisa i 1 cm kwicala ngalinye?

7. Kulo mzobo kudityaniswe izangqa ezine eziziziqingatha, ngasinye sine rediyasi esisi 4 cm. Ingaba i area yalo mzobo ingakanani?

7. Die figuur is 'n samestelling van vier semisirkels, elk met 'n radius van 4 cm. Wat is die oppervlakte van die figuur?

8. Ek het twee opeenvolgende getalle (bv. 4 en 5) op my sakrekenaar vermenigvuldig en die antwoord is 702. Wat is die som van die twee getalle?

8. Ndiphinda phinda amanani amabini alandeelanayo (umz. isi 4 kunye nesi 5) kwi calculator yam ndifumane ama 702. Ingaba isiphumo sokudityaniswa kwalamanani singubani?

None of these
(E) Nie een hiervan nie
Ayiko kwezi

9. Watter van hierdie breuke is die grootste?

9. Ingaba kula maqhezu leliphi elona likhulu?

10. A painter takes two days to paint a room (all four walls and the ceiling). If he works at the same pace, how many days will he take to paint a room that is twice as wide, twice as long and twice as high?

(A) 2

(B) 4

11. Thandi's average for Mathematics after her first 4 tests is 67%. In the next 2 tests she obtained 63% and 67%. What is her average now? (All the tests have the same weight.)

(A) 66,3

(B) 66

12. How many two-digit numbers are there with both digits even?

(A) 20

(B) 25

13. The prices marked on articles in the cafe already include 14% VAT. How much VAT do you pay if you buy a 2 litre Coke marked R9,46?

(A) R1,32

(B) R1,33

14. How many whole numbers n are there such that

$$\frac{5}{61} < \frac{1}{n} < \frac{13}{57}$$

(A) 1

(B) 6

10. 'n Verwer neem twee dae om 'n kamer te verf (al vier mure en die plafon). As hy teen dieselfde pas werk, hoeveel dae sal hy verf aan 'n kamer twee keer so lank, twee keer so breed en twee keer so hoog?

(C) 5

(D) 6

(E) 8

11. Thandi se gemiddelde vir Wiskunde na haar eerste 4 toetse is 67%. In die volgende 2 toetse het sy 63% en 67% behaal. Wat is haar gemiddelde nou? (Al die toetse dra dieselfde gewig.)

(A) 63

(B) 65

(E) 66,5

12. Hoeveel tweesyfer-getalle is daar met beide syfers ewe?

(C) 45

(D) 50

12. Mangaphi amanani akhoyo anedijithi ezimbini ezingamanani ohluleka ngesibini? (even numbers)

(E) 30

13. Die gemerkte pryse van artikels in die kafee sluit reeds 14% BTW in. Hoeveel BTW betaal jy as jy 'n 2 liter-Coke koop wat R9,46 gemerk is?

(A) R1,16

(D) R1,17

None of these
(E) Nie een hiervan nie
Ayikho kwezi

14. Hoeveel heelgetalle n is daar sodat

$$\frac{5}{61} < \frac{1}{n} < \frac{13}{57}$$

(C) 7

(D) 8

(E) 9

10. Umuntu opeyintayo uthathe intsuku ezimbini ukupeyinta igumbi (iindonga zone kunye nophahla lwangaphakathi). Ukuba usebenza ngesantya esilinganayo uyakuthatha ixesha elingakanani ukupeyinta elinye igumbi elinobubanzi obubuphinda kabini obegumbi lokuqala, kunye nobude obubuphindaphinda kabini obegumbi lokuqala kunye nokuphakama okukuphindaphinda kabini obegumbi lokuqala?

11. Umyinge (average) wamanqaku ka Thandi ezi Balo emva kokuvavanywa amaxesha ama 4 ungama 67%. Kwimviwo ezi 2 ezilandelayo wafumana ama 63% kunye nama 67%. Ingaba umyinge wakhe ungakanani ngoku? (Zonke ezi mviwo zinamanqaku alinganayo)

13. Ixabiso lezinto elibhalwe kuzo kwivenkilana liselifikwe ixabiso lentengo (VAT) eli 14%. Ingaba uhlawula ixabiso ntengo elingakanani ukuba uthenga I 2 liter ye Coke nge R9, 46?

None of these
(E) Nie een hiervan nie
Ayikho kwezi

14. Mangaphi amanani azeleyo angu n akhoyo anokwenza u

$$\frac{5}{61} < \frac{1}{n} < \frac{13}{57}$$

15. Sandy is 7 years younger than Mandy. In 4 years time she will be half Mandy's age. What is the sum of their ages now?

(A) 13

(B) 15

16. A $3 \times 3 \times 3$ cube is formed using $1 \times 1 \times 1$ cubes. A number of the smaller cubes are removed by punching out cubes all the way from front to back, from top to bottom and from side to side in the shaded regions shown. How many smaller cubes are left?

(A) 18

(B) 19

17. If a $5 \times 5 \times 5$ cube is formed using $1 \times 1 \times 1$ cubes and smaller cubes are removed by punching out cubes all the way from front to back, from top to bottom and from side to side in the shaded regions shown, how many smaller cubes are left?

(A) 50

(B) 80

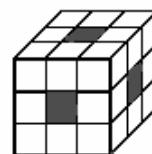
15. Sandy is 7 jaar jonger as Mandy. Oor 4 jaar sal sy die helfte so oud as Mandy wees. Wat is die som van hul huidige ouderdomme?

(C) 17

(D) 19

(E) 21

15. U Sandy mncinane ngeminyaka esi 7 kuno Mandy. Kwiminyaka emi 4 iyakuba iminyaka yakhe isisiqingatha seminyaka ka Mndy. Xa idityanisiwe mingaphi iminyaka yabo ngoku?

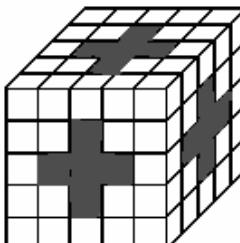


(C) 20

(D) 21

(E) 22

16. 'n $3 \times 3 \times 3$ kubus word met $1 \times 1 \times 1$ kubusse gebou. 'n Aantal van die klein kubusse word dan van voor na agter, van bo na onder en van kant tot kant uitgeslaan soos met die verdonkering gewys word. Hoeveel van die klein kubusse is oor?



17. As 'n $5 \times 5 \times 5$ kubus met $1 \times 1 \times 1$ kubusse gebou word en klein kubusse word van voor na agter, van bo na onder en van kant tot kant uitgeslaan soos met die verdonkering gewys word, hoeveel van die klein kubusse is oor?

None of these
(E) Nie een hiervan nie
Ayikho kwezi

(A) 50

(B) 80

(C) 76

(D) 72

18. To allow for expansion and contraction a gap of d cm is left between two rails. The size of the gap is given by the formula $d = 2,4 - 0,05 \times t$ where t is the temperature in degrees Celsius. On the day when the railway was constructed the temperature was 22°C . How big a gap should the workers leave between two rails?

(A) 1,3 cm

(B) 2,35 cm

19. Refer to the previous question. One night during the winter the temperature in the vicinity of the railway drops to -2°C . How big is the gap between two rails?

(A) 2,3 cm

(B) 2,35 cm

20. Lee can afford to buy either 6 cans of Coke and 7 packets of chips or 8 cans of Coke and 4 packets of chips. Both options leave her with no change whatsoever. If, however, she bought only chips, how many packets could she afford?

(A) 11

(B) 12

21. In a banana eating competition a competitor ate 90 bananas in 4 hours. Each hour he ate 5 less bananas than in the previous hour. How many bananas did he eat in the last hour?

(A) 70

(B) 15

18. Om voorsiening te maak vir uitsetting en inkrimping word 'n opening van d cm tussen twee spoorstawe gelaat. Die grootte van die opening word gegee deur die formule $d = 2,4 - 0,05 \times t$ waar t die temperatuur in grade Celsius is. Op die dag waarop die spoorlyn gelê word, is die temperatuur 22°C . Hoe groot opening moet die werkers tussen twee spoorstawe laat?

(C) 3,5 cm

(D) 2,29 cm

18. Ukuvumela ukuba iziporo ezimbini zikaloliwe zibe nokucutheka okanye zivuleke umgama ongama d cm uye wenziwa phakathi kwazo. Ubukhulu balo mgama bubalwa nge formula ethi $d = 2,4 - 0,05 \times t$ apho u t ebonisa ubushushu kusetyenziswa umlinganiso we degrees Celcius. Kusuku esakhawa ngaso esisiporo ubushushu babungama 22°C . Ingaba ungakanani umgama onokuthi ushiywe ngabasebenzi phakathi kwezi ziporo zimbini?

None of these
(E) Nie een hiervan nie
Aayikho kwezi

19. Verwys na die vorige vraag. Een nag in die winter daal die temperatuur in die omgewing van die spoorlyn tot -2°C . Hoe groot is die opening tussen twee spoorstawe?

(C) 2,39 cm

(D) 2,45 cm

19. Jonga kumbuzo ongentla. Ngobunye ubusuku ebusika ubushushu behla baba yi -2°C . Waba ngakanani umgama ophakathi kwezi ziporo zimbini?

(E) 2,5 cm

20. Lee het genoeg geld om of 6 blikkies Coke en 7 pakkies chips te koop of 8 blikkies Coke en 4 pakkies chips. In albei gevalle het sy geen geld oor nie. As sy egter net chips koop, hoeveel pakkies kan sy bekostig?

(C) 13

(D) 16

20. U Lee unokuthi akwazi ukuthenga isi 6 senkonkxa ze Coke kunye nesi 7 sepakethi zama chips okanye engenzanga njalo akwazi ukuthenga isi 8 senkonkza ze Coke kunye nesi 4 sepakethi zama chips. Zombini ezindlela anokuthenga ngazo ziyakumenza angabuyelwa yiitshintshi nakanjanina. Ukuba ke uthi agqibe ukuba athenge ii chips kuphela, zingaphi iipakethi angazithengayo?

(E) 25

21. In 'n piesangeet-kompetisie eet 'n deelnemer 90 piesangs in 4 uur. Elke uur eet hy 5 minder piesangs as gedurende die vorige uur. Hoeveel piesangs het hy in die laaste uur geëet?

(C) 86

(D) 60

21. Kukhuphiswano lokutyiwa kweebhana, othabatha inxaxheba utye iibhana ezingama 90 ngeeyure ezi 4. Kwiyure nganye utha watya ibhana ezi 5 ngaphantsi kuneebhana azitye kwiyure engaphambi kwaleyo. Zingaphi ibhanan awazitya kwiyure yokugqibela?

(E) 22

22. Patrick Green's initials are PG. Hannah Brown's initials are HB. A firm makes handkerchiefs with all possible combinations of two initials. How many different combinations are possible?

(A) 676

(B) 338

23. John builds houses as shown. When there are 3 houses, there are 13 matches. When there are 7 houses, there are 29 matches. How many matches does he need to make 20 such houses?

(A) 81

(B) 80

24. In question 23, if John has 225 matches, how many such houses can he build if he uses all the matches?

(A) 50

(B) 52

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

(A) 321

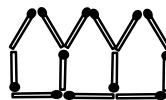
(B) 431

22. Patrick Green se voorletters is PG. Hannah Brown se voorletters is HB. 'n Fabriek vervaardig sakdoeke met twee voorletters daarop. Hoeveel verskillende kombinasies van twee voorletters is moontlik?

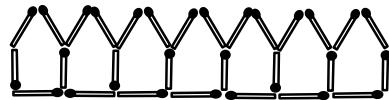
(C) 52

(D) 650

23. John bou huise soos getoon. Vir 3 huise gebruik hy 13 vuurhoutjies en vir 7 huise 29 vuurhoutjies. Hoeveel vuurhoutjies gebruik hy vir 20 sulke huise?



(C) 85



(D) 84

None of these
(E) Nie een hiervan nie
Ayikho kwezi

22. Onobumba begama lika Patrick Green bangu PG. Abaka Hannah Brown bangu HB. Umzi owenza amatshefu wenza amatshefu usebenzisa zonke iindlela zabnobumba bobabini. Zingaphi iindlela ezahlukeneyo abanokudinatyaniwa ngayo aba nobumba?

(E) 83

24. Kwakhona uJona uyakha njengoko ubonisiweyo. Xa izndlu ezakhiweyo, zi-3, Usebenzisa izinti ezili-13. Xa esakha izindlu ezisi-7, usebenzisa izinti ezingama-29. Zingaphi izinti ezisebenza ukwakha izindlu ezingama-20? Cinga, zingela usebenzisa onke amacebo okucinga(okuphonononga imeko).

(E) 58

24. In vraag 23: as John 225 vuurhoutjies het, hoeveel sulke huise kan hy bou as hy al die vuurhoutjies gebruik?

(C) 54

(D) 56

25. Verwys na vraag 23: John het baie verskillende huise gebou. Watter van die volgende kan nie die getal vuurhoutjies wees wat hy vir 'n huis gebruik het nie?

(C) 281

(D) 441

25. Kumbuzo we-23 xa uJona enezinti ezili-121, zingaphi izindlu anokuzakha? Zathuza uze nempendulo.

(E) 861