Mathematics Challenge

GRADE 7 FINAL ROUND
31 OCTOBER 2001

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!

Wiskunde-uitdaging

GRAAD 7 FINALE RONDE
31 OKTOBER 2001

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 WOKUGQIBELA
31 OKTHOBHA 2001

QAPHELA:

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

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1. Gavin bungee-jumps from a 80-m bridge towards a river below. He falls 40 m before the bungee cord starts to stretch. This cord can stretch 95% of its length. How far above the river does Gavin bounce back?

(A) 10 m (B) 5 m (C) 4 m (D) 2 m (E) 1 m

1. Gavin doen 'n bungee sprong vanaf 'n 80-m hoê brug bo ’n rivier. Hy val 40 m voor die bungee koord begin rek. Hierdie koord kan 95% van sy lengte rek. Hoe hoog bo die rivier bons Gavin terug?

1. U Gavin uthe watsibela kumlambo osemazantsi esukela kwincopho ekuma 80 m. Wayekumgama ongama 40 m xa intambo yakhe yokutsiba yathi yaqalisa ukunwebeka. Lentambo inokunwebeka ngama 95% obude bayo. Ingaba bubudeobungakanani ukusukela emlanjeni ukunyukela phezulu anokuthi uGavin akwazi ukubutsiba?

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

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

2. Ingaba yeyiphi kwzi engeyonyani?

Western Cape
Wes-Kaap
Ntshona-Koloni

AMESA
The Association for Mathematics Education of South Africa

In cooperation with the
Western Cape Education Department

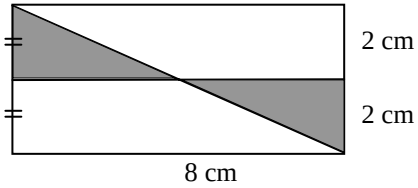
Nasou Via Afrika

CASIO

RUMEUS
Research Unit for Mathematics Education of the University of Stellenbosch

30 What fraction of the whole figure is shaded?

3. Watter breuk van die hele figuur is verdonker?

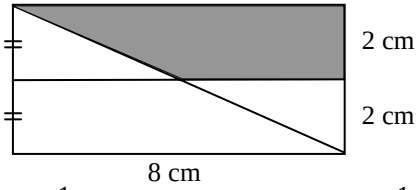


3. Le ndawo yenziwe mnyama iliqhezu elingakanani lalo mzobo?

(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?

4. Watter breuk van die hele figuur is verdonker?

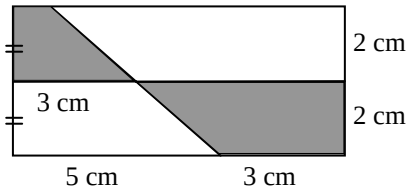


4. Le ndawo yenziwe mnyama iliqhezu elingakanani lalo mzobo?

(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?

5. Watter oppervlakte is in die figuur verdonker?



5. Le ndawo yenziwe mnyama iyi area engakanani?

(A) 16 cm^2 (B) 12 cm^2 (C) 10 cm^2 (D) 8 cm^2 (E) Not enough information / Te min inligting / Ingxelo enikiweyo ayonelanga

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

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

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

(A) 20 (B) 25 (C) 45 (D) 50 (E) 30

7. 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

7. 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?

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

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

8. 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 (C) 5 (D) 6

8. ’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?

8. Umntu 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?

(E) 8

9. In a transaction a customer receives 10% discount for cash, but must pay 14% Value Added Tax (VAT). Which is cheaper for the customer: that the tax be calculated first or that the discount be calculated first?

(A) Tax / Belasting / Ixabiso -ntengo (B) Discount / Afslag / Isaphulelo (C) It does not matter / Maak nie saak nie / Ayenzi mahluko (D) Not enough information / Te min inligting / Ingxelo enikiweyo ayonelanga

9. 'n Klant ontvang 10% afslag vir kontant in 'n transaksie, maar moet 14% Belasting op Toegevoegde Waarde (BTW) betaal. Wat is die goedkoopste vir die klant: dat die afslag eerste bereken word of dat die belasting eerste bereken word?

9. Xa umthengi ethenga uye afumane isaphulelo se 10% ukuba uthenga ngemali, kodwa kufuneka ehlawule i 14% yexabiso lentengo (VAT). Yeyiphi eyona ndlela yongayo kumthengi ukuba ixabiso lentengo libalwa kuqala okanye kuqala kufakwe isaphulelo?

10. Basheera noted that school fees increased by 10% in 2000 and by 20% in 2001. What was the percentage increase in school fees over the two year period?

(A) 15% (B) 25% (C) 30% (D) 32%

10. Basheera merk op dat die skoolgelde in 2000 met 10% verhoog het en in 2001 met 20% verhoog het. Wat was die persentasie verhoging in skoolgelde oor die twee-jaar tydperk?

10. U Gloria wabona ukuba kunyaka wama 2000 iindleko zesikolo (school fees) zakhula ngesi 10% zaza kunyaka wama 2001 zenyuka ngesi 20%. Kwesi sithuba seminyaka emibini ingaba ezi ndleko zenyuke nge pesenti ezingaphi?

(E) 34%

11. Which of these fractions is the largest?

(A) $\frac{7}{15}$ (B) $\frac{3}{7}$ (C) $\frac{11}{23}$ (D) $\frac{4}{9}$

11. Watter van hierdie breuke is die grootste?

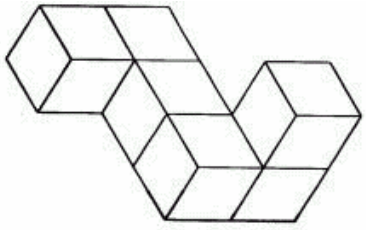
11. Ingaba kula maqhezu leliphi elona likhulu?

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

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

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

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



(A) 25 XXXXX cm^2 (B) 28 cm^2 (C) 29 cm^2 (D) 30 cm^2 (E) None of these / Nie een hiervan nie / Ayikho kwezi

13. 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.)

13. 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.)

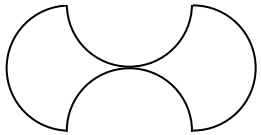
13. Umyinge (average) wamanqaku ka Thandi ezi Balo emva kokuvavanywa amaxesha ama 4 ungama 67%. Kwimviwo ezi 2 ezilandelayo wafumana ama 63% kunye nama 67%. Ingaba umyinge wakhe ungakanani ngoku? (Zonke ezi mviwo zinamanqaku alinganayo)

(A) 66,3 (B) 66 (C) 63 (D) 65 (E) 66,5

14. The figure is a combination of four semi-circles, each with a radius of 3 cm. What is the area of the figure?

14. Die figuur is 'n samestelling van vier semisirkels, elk met 'n radius van 3 cm. Wat is die oppervlakte van die figuur?

14. Kulo mzobo kudityaniswe izangqa ezine eziziziqingatha, ngasinye sine rediyasi esisi 3 cm. Ingaba i area yalo mzobo ingakanani?



(A) 24 cm^2 (B) 9 cm^2 (C) 36 cm^2 (D) Not enough information / Te min inligting / Ingxelo enikiweyo ayonelanga (E) None of these / Nie een hiervan nie / Ayikho kwezi

15. The table shows the average rainfall (millilitres) per month in Cape Town.

15. Die tabel toon die gemiddelde reënval (milliliters) per maand in Kaapstad.

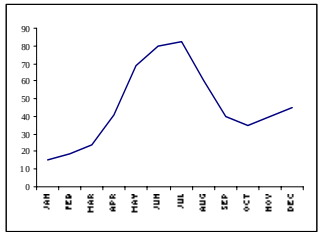
15. Le tafile yamanani ibonisa umyinge (average) wokuna kwemvula e Cape Town.

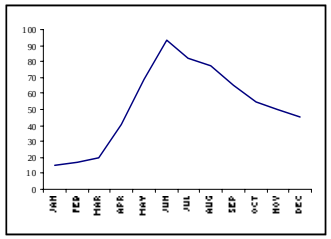
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
15	17	30	41	69	70	75	70	40	30	20	10

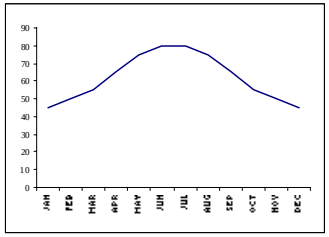
Which line graph best illustrates the data?

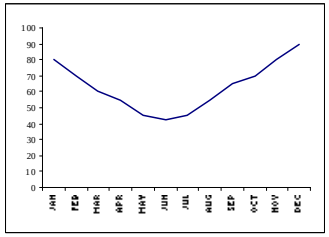
Watter lyngrafiek illustreer die data die beste?

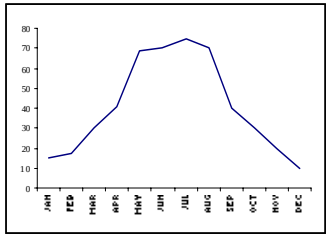
Yeyiphi igrafu ebona kakuhle la manani anikiweyo?

(A) 

(B) 

(C) 

(D) 

(E) 

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

(A) R1,32 (B) R1,33 (C) R1,16 (D) R1,17

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

(A) R1,32 (B) R1,33 (C) R1,16 (D) R1,17

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

(A) R1,32 (B) R1,33 (C) R1,16 (D) R1,17 (E) None of these / Nie een hiervan nie / Ayikho kwezi

17. How many whole numbers n are there such that

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

(A) 1 (B) 6 (C) 7 (D) 8

17. Hoeveel heelgetalle n is daar sodat

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

(A) 1 (B) 6 (C) 7 (D) 8

17. Mangaphi amanani azeleyo angu n akhoyo anokwenza u

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

(A) 1 (B) 6 (C) 7 (D) 8 (E) 9

18. 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 (C) 17 (D) 19

18. 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?

(A) 13 (B) 15 (C) 17 (D) 19

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

(A) 13 (B) 15 (C) 17 (D) 19 (E) 21

19. John is walking at his normal pace. After taking a number of equal paces (steps), the total distance he has walked is precisely 12,73 metres. How many paces did he take?

(A) 10 (B) 19 (C) 15 (D) 20 (E) Not enough information / Te min inligting / Ingxelo enikiweyo ayonelanga

19. John stap teen sy normale pas. Nadat hy 'n aantal ewe groot treë gestap het, is die afstand wat hy gestap het presies 12,73 meter. Hoeveel treë het hy gestap?

19. U John uhamba ngesantya sakhe sesiqhelo. Emva kokuhamba inyawoezilinganayo, umgama awuhambileyo uba li 12,73 see mitha gingci. Zingaphi iinyawo azihambileyo?

20. 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 (C) 52 (D) 650 (E) None of these / Nie een hiervan nie / Ayikho kwezi

20. 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?

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

21. 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 (C) 3,5 cm (D) 2,29 cm (E) None of these / Nie een hiervan nie / Aayikho kwezi

21. 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?

21. 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 esakhiwa ngaso esisiporo ubushushu babungama 22°C. Ingaba ungakanani umgama onokuthi ushiywe ngabasebenzi phakathi kwezi ziporo zimbini?

22. 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 (C) 2,39 cm (D) 2,45 cm (E) 2,5 cm

22. 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?

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

23. Leigh 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 (C) 13 (D) 16 (E) 25

23. Leigh 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?

(A) 11 (B) 12 (C) 13 (D) 16 (E) 25

23. U Leigh 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 yitshintshi nakanjanina. Ukuba ke uthi agqibe ukuba athenge ii chips kuphela, zingaphi iipakethi angazithengayo?

(A) 11 (B) 12 (C) 13 (D) 16 (E) 25

24. 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 (C) 86 (D) 60 (E) 22

24. 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?

(A) 70 (B) 15 (C) 86 (D) 60 (E) 22

24. Kukhuphiswano lokutyiwa kweebhanana,othabatha inxaxheba utye iibhanana ezingama 90 ngeeyure ezi 4. Kwiyure nganye uthe watya ibhanana ezi 5 ngaphantsi kuneebhanana azitye kwiyure engaphambi kwaleyo. Zingaphi ibhanan awazitya kwiyure yokugqibela?

(A) 70 (B) 15 (C) 86 (D) 60 (E) 22

25. On the planet Gamma they have a different kind of arithmetic. Here are a few Gamma calculations:

$4 + 2 = 6$	$4 \times 3 = 4$
$4 + 6 = 2$	$6 \times 3 = 2$
$7 + 3 = 2$	$6 \times 5 = 6$
$7 + 6 = 5$	$8 \times 5 = 0$

What is the answer of 6×7 on Gamma?

(A) 4 (B) 5 (C) 2 (D) 3 (E) 6

25. Op die planeet Gamma doen hulle 'n ander soort rekenkunde. Hier is 'n paar Gamma-berekeninge:

$4 + 2 = 6$	$4 \times 3 = 4$
$4 + 6 = 2$	$6 \times 3 = 2$
$7 + 3 = 2$	$6 \times 5 = 6$
$7 + 6 = 5$	$8 \times 5 = 0$

Wat is die antwoord van 6×7 op Gamma?

(A) 4 (B) 5 (C) 2 (D) 3 (E) 6

25. Kwi planeti u Gamma banendlela eyahlukileyo yokubala izibalo ze arithmetic. Nantsi imizekelo embalwa yendlela ekubalwa ngabakwa Gamma:

$4 + 2 = 6$	$4 \times 3 = 4$
$4 + 6 = 2$	$6 \times 3 = 2$
$7 + 3 = 2$	$6 \times 5 = 6$
$7 + 6 = 5$	$8 \times 5 = 0$

Ngokwaka Gamma, $6 \times 7 = ?$

(A) 4 (B) 5 (C) 2 (D) 3 (E) 6