Mathematics Challenge

GRADE 7 FINAL ROUND
16 OCTOBER 2002

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. Calculate the area of the shaded part:

(A) 19 cm^2 (B) 23 cm^2

2. What is the perimeter of the figure in question 1?

(A) 21 cm (B) 32 cm

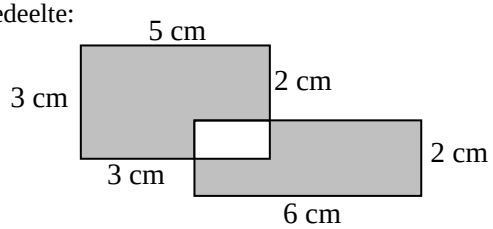
Wiskunde-uitdaging

GRAAD 7 FINALE RONDE
16 OKTOBER 2002

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. Bereken die oppervlakte van die verdonkerte gedeelte:



(C) 25 cm^2 (D) 26 cm^2

2. Wat is die omtrek van die figuur in vraag 1?

(C) 30 cm (D) 28 cm

Umceli-mngeni Ngezibalo

GRADE 7 UMJIKELO WOKUGQIBELA
16 OKTHOBHA 2002

QAPHELA:

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

1. Bala ukuba ingakanani i eriya yendawo eyenziwe mfiliba kulomzobo:

(E) 27 cm^2

2. Ngokombuzo ongentla: buyintoni ubude bomphandle bomzobo?

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

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

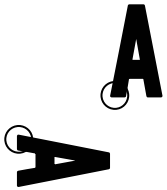
CASIO

RUMEUS
Research Unit for Mathematics Education of the University of Stellenbosch

3. The letter A is rotated 180° about O. What will he position of A be now?

(A)  (B) 

3. Die letter A word deur 180° om O geroteer. Wat is die posisie van A nou?

(C)  (D) 

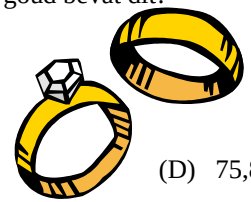
3. Unobumba u A ujikeleziswa I 180° ku O. Uyakuba ejonge kweliphi icala u A ke ngoku?

(E) 

4. The unit *karat* is used to indicate the amount of pure gold contained in an item. Pure gold is generally too soft to be used for jewellery, so other metals are added. The resulting gold/metal mixture is called an alloy. 24 karat gold is pure gold, while 18 karat gold contains 18 parts gold and 6 parts of other metals metals. If the mass of a 9 karat gold ring is 180 g, what mass gold does it contain?

(A) 90 g (B) 108 g

4. Die eenheid *karaat* word gebruik om die hoeveelheid suiwer goud in 'n item aan te dui. Suiwer goud is te sag om in juwele gebruik te word, dus word ander metale bygevoeg. Ons noem die goud/metaal mengsel 'n allooi. 24 karaat goud is suiwer goud, terwyl 18 karaat goud 18 dele goud en 6 dele ander metale bevat. As die massa van ’n 9 karaat goue ring 180 g is, watter massa goud bevat dit?



(C) 67,5 g (D) 75,8 g

4. I gama elithi kharethi lichaza umlinganiselo wegolide esulungekileyo ethi ifumaneke kwinto ethile. Igolide esulungekileyo ithambe kakhulu kangangokuba ayinako ukusetyenziswa yodwa xa kwakhiwa izacholo. Umxube wegolide nezinye izinyithi ubizwa ngokuba yi alloy. Ama 24 kharethi achaza ukuba kukho igolide esulungekileyo, lize i 18 leekharethi lichaze ukuba kukho i 18 senxaleny yegolide esulungekileyo kunye nesi 6 senxalenye yezinye izinyithi. Ukuba ubunzima bomsesane we 9 sekharethi buli 180 g, ingaba bungakanani ubunzima begolide esulungekileyo obufumaneka kuwo?

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

5. The *carat* is a unit of mass used for gemstones, and is equal to 200 mg. The largest cut diamond in the world is the 530,20 carat Star of Africa, now one of the British Crown Jewels. What is the mass of the Star of Africa in grams?

(A) 265,1 g (B) 1060,4 g

5. Die *karaat* is 'n eenheid van massa van edelgesteentes en is gelyk aan 200 mg. Die grootste geslypte diamant ter wereld is die 530,20 karaat Ster van Afrika, nou deel van die Britse kroonjuwele. Wat is die massa van die Ster van Afrika in gram?

(C) 106,04 g (D) 10604 g

5. I kharethi ligama elichaza ubunzima bamatye anqabileyo, kwaye lilingana nama 200 mg. Elona litye ledayimani lilielon likhulu emhlabeni libizwa ngokuba yi 530,20 kharethi Star of Africa, ekungoku lilelinye lezacholo zesi Thsaba sase Britani. Ingaba bungakanani ubunzima balo ngokwe grams.

(E) 216 g

6. What is the smallest number that is divisible by 2; 3; 4; 5; 6; 7; 8 and 9?

(A) $3\times4\times5\times7\times9$ (B) $5\times7\times8\times9$

6. Wat is die kleinste getal wat deelbaar is deur 2; 3; 4; 5; 6; 7; 8 en 9?

(C) $4\times5\times6\times7\times8\times9$ (D) $5\times6\times8\times9$

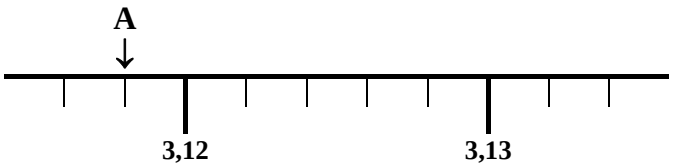
6. Leliphi elona nani lincinci elinokuphindaphindwa ngo 2; 3; 4; 5; 6; 7; 8 and 9?

(E) $2\times3\times4\times5\times6\times7\times8\times9$

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

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

7. Leliphi inani eliboniswa ngu A ?

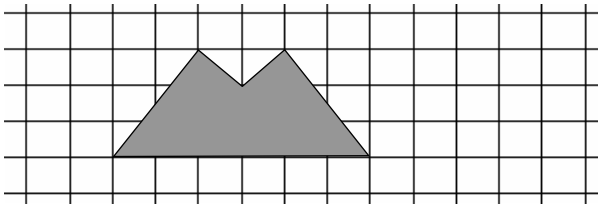


(A) 3,11 (B) 3,1 (C) 3,118 (D) 3,15 (E) 3,18

8. What is the area of the shaded figure below if one square represents 1 cm^2 ?

8. Wat is die oppervlakte van die verdonkerde figuur hieronder as een vierkantjie 1 cm^2 voorstel?

8. Buka ukukhulu bendawo eyenziwe mnyama kumfanekiso ukuba isikwere esinye simele i1 cm^2 ?



(A) 9 cm^2 (B) 10 cm^2 (C) 11 cm^2 (D) 12 cm^2 (E) 13 cm^2

9. What is the difference between the sum of the even numbers and the sum of the odd numbers from 1 to 100 inclusive?

9. Wat is die verskil tussen die som van die ewe getalle en die som van die onewe getalle van 1 tot 100 ingesluit?

9. Ungakanani umahluko ophakathi kwesiphumo sokudityaniswa kwamanani a ivini(even number) nesiphumo sokudityaniswa kwamanani ayiminqakathi (odd number) asukela kwisi 1 ukuyakuma nge 100?

(A) 50 (B) 51 (C) 49 (D) 100 (E) 99

10. 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?

10. 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?

10. 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

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

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

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

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

12. 20 can be written as the sum of two squares:

$20 = 4 + 16 = 2^2 + 4^2$

In how many different ways (ignore the order) can 85 be written as the sum of two squares?

(A) 0 (B) 1 (C) 2 (D) 4 (E) 5

12. 20 kan geskryf word as die som van twee vierkante:

$20 = 4 + 16 = 2^2 + 4^2$

Op hoeveel verskillende maniere (ignoreer die volgorde) kan 85 as die som van twee vierkante geskryf word?

12. Ama 20 angabhalwa njengesiphumo sokudityaniswa kwezikweri ezimbini:

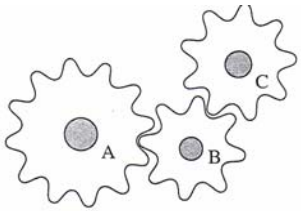
$20 = 4 + 16 = 2^2 + 4^2$

Kungandlela zingaphi ezahlukeneyo (ungaqwalaselanga ulandelelwano) apho ama 85 anokubhalwa njengesiphumo sokudityaniswa kwezikweri ezimbini?

13 Three gears mesh together as shown. In the time that gear A makes three revolutions, how many revolutions does gear C make?

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

13. Drie ratte werk saam soos getoon. In die tyd dat rat A drie omwentelings maak, hoeveel omwentelings maak rat C?



13. II geri ezintathu zidibana zonke ngolu hlobo lubonakalisiweyo. Kwisithuba apho igeri A ijekeleza ngokupheleleyo, iba yona igeri C ijekeleze amathuba amangaphi?

14. Split the number 18 into two whole numbers (e.g. 3 and 15). Now multiply these two numbers. What is the largest possible answer?

(A) 80 (B) 77 (C) 72 (D) 100 (E) None of these / Nie een hiervan nie / Ayiko kwezi

14. Verdeel die getal 18 in twee telgetalle (bv.3 en 15). Vermenigvuldig nou hierdie twee getalle. Wat is die grootste moontlike antwoord?

14. Cazulula inani le18 libe ngamanani angangomaqhezu (umzekelo isi3 kunye ne 15) Waphindaphinde kunye la manani. Leliphi elona nani likhulu elinokuba sisiphumo?

15. How many whole numbers divide exactly into 2000 (i.e. how many *factors* does 2000 have)?

(A) 15 (B) 18 (C) 19 (D) 20 (E) None of these / Nie een hiervan nie / Ayiko kwezi

15. Hoeveel telgetalle deel presies in 2000 in (d.w.s. hoeveel *faktore* het 2000)?

15. Mangaphi amanani angangomaqhezu ohluleka ngokupheleleyo kungabikho ntsalela kuma 2000?

16. In the magic square below the sum of the three numbers in each row, in each column and in each diagonal is 18. What number comes in block Z?

16. In die towervierkant hieronder is die som van die drie getalle in elke ry, in elke kolom en in elke skuinslyn gelyk aan 18. Watter getal kom in blokkie Z?

16. Kwesi sikwere sobugqi singezantsi isiphumo sokudityaniswa kwamanani amathathu asemgceni ngamnye, akuluhlu ngalunye kunye nasemgceni oxwesileyo (diagonal) siba li 18. Ngubani inani elikwibloko u Z?

		Z
11	6	
		10

(A) 1 (B) 3 (C) 9 (D) 7 (E) None of these / Nie een hiervan nie / Ayiko kwezi

17. The three digits of a three-digit number add up to 25. How many such three-digit numbers are there?

17. Die som van die drie syfers van ’n driesyfergetal is 25. Hoeveel sulke driesyfergetalle is daar?

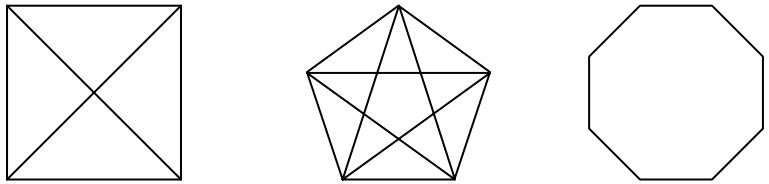
17. Ii dijithi zenani eline dijithi ezintathu ziba ngama 25 xa zidityanisiwe.Mangaphi amanani anjalo ane dijithi ezintathu anokwenzeka?

(A) 2 (B) 4 (C) 6 (D) 8 (E) 10

18. A square has 2 diagonals and a pentagon has 5. How many diagonals does an octagon have? (An octagon has 8 sides.)

18. ’n Vierkant het 2 hoeklyne en ’n vyfhoek het 5. Hoeveel hoeklyne het ’n agthoek?

18. Isikwere sineedayagonali ezi 2 ize ipentagoni ibe nedayagonali ezi 5. Zingaphi idayagonali ezifumaneka kwi oktagoni (i oktagoni inamacala asi 8)?



(A) 20 (B) 28 (C) 16 (D) 24 (E) 40

19. The average of eleven numbers is 8. If a twelfth number is added to these numbers, the average of all twelve numbers is now 11. What is the twelfth number added?

19. Die gemiddelde van elf getalle is 8. As ’n twaalfde getal by hierdie getalle getel word, is die gemiddelde van al twaalf getalle nou 11. Wat is die twaalfde getal wat bygetel is?

19. I average yamanani alishumi elinanye sisi 8. Ukuba kudityaniswe elinye inani kula manani I average yalamanani alishumi elinesibini iba ngu 11. Lingubani eli nani le shumi elinambini lithe laditya niswa?

(A) 11 (B) 12 (C) 33 (D) 44 (E) Impossible to say / Onmoontlik om te sê / Ayikho inkcazelo eyaneley

20. Before his last mathematics test John's average for mathematics was exactly 62%. In his last test he scored 70%, which increased his average to exactly 64%. How many mathematics tests did John write all together?

(A) 7 (B) 6 (C) 5 (D) 4 (E) 3

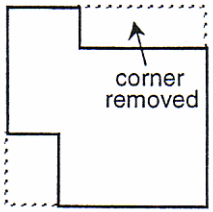
20. Voor sy laaste wiskundetoets was John se gemiddeld presies 62%. Vir sy laaste toets het hy 70% gekry, wat sy gemiddeld na presies 64% opgestoot het. Altesaam hoeveel wiskundetoetse het John altesaam geskryf?

20. Phambi kovavanyo lokugqibela luka John lwe Mathematiki umyinge wakhe wawungama 62%. Kuvavanyo lwakhe lokugqibela uzuze ama 70%, ethe yenyusa umyinge wakhe waba ngama 64% ngqo. Zingaphi iimvavanyo ezabhalwa ngu John zizonke?

21. Bingo bought a square carpet. He cut out two rectangles as shown in the sketch, and the carpet then exactly fitted the shape of his bedroom. If the perimeter of the room is 12 m, what was the area of the original square of carpet?

(A) 144 m^2 (B) 12 m^2 (C) 16 m^2 (D) 9 m^2 (E) Not enough information

21. Bingo koop 'n vierkantige mat. Hy sny twee reghoeke uit soos in die skets getoon, en die mat pas toe presies die vorm van sy slaapkamer. As die omtrek van die kamer 12 m is, wat was die oppervlakte van die oorspronklike vierkantige mat?



(A) 144 m^2 (B) 12 m^2 (C) 16 m^2 (D) 9 m^2 (E) Nie genoeg inligting nie

21. U Bingo wathi wathenga I khaphethi esisikwere. Wasika inxalenye yayo ngokuthi akhuphe iingxande azimbini njengokuba kubonisiwe kulo mzobo, yaze emva koko le khaphethi yaba nokungena gingci kwigumbi lakhe lokulala. Ukuba xa kudityaniswa amacala odonga eli gumbi isiphumo siba li 12, ibingakanani I eriya yekhaphethi phambi kokuba isikwe?

(A) 144 m^2 (B) 12 m^2 (C) 16 m^2 (D) 9 m^2 (E) Akukho nkcazelo yaneleyo

22. Zola uses dots to build triangle patterns as shown below. How many dots will she use for $\boldsymbol{T}_{50}$?

$\boldsymbol{T}_1$ $\boldsymbol{T}_2$ $\boldsymbol{T}_3$ $\boldsymbol{T}_4$ $\boldsymbol{T}_5$ $\boldsymbol{T}_6$ $\boldsymbol{T}_7$

(A) 2601 (B) 1275 (C) 2550 (D) 1250 (E) None of these

22. Zola bou driehoek patrone met kolletjies soos hieronder. Hoeveel kolletjies sal sy gebruik vir $\boldsymbol{T}_{50}$?

(A) 2601 (B) 1275 (C) 2550 (D) 1250 (E) Nie een hiervan nie

22. U Zola usebenzisa amachokoza ukwakha lo mfanekiso ungezantsi. Kengoko mangaphi amachokoza anokuwasebenzisa ukwakha umzobo $\boldsymbol{T}_{50}$?

(A) 2601 (B) 1275 (C) 2550 (D) 1250 (E) Ayiko kwezi

23. Which one of the following numbers will appear in the sequence

2; 5; 10; 17; 26; 37; ...?

(A) 901 (B) 902 (C) 903 (D) 904

23. Watter een van die volgende getalle sal voorkom in die getalry

2; 5; 10; 17; 26; 37; ...?

23. Leliphi kula manani alandelayo elizakuvela kolu luhlu

2; 5; 10; 17; 26; 37; ...?

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

24. A goldmine mines 5% of its total reserves per year. on average. After about how many years will it have extracted half of its reserves?

(A) 5 (B) 10 (C) 13 (D) 14

24. ’n Goudmyn ontgin gemiddeld 5% van sy totale kapasiteit per jaar. Na omtrent hoeveel jaar sal die helfte van die kapasiteit ontgin wees?

24. Umgodi wegolide uthi wembe umndilili (average) 5% wogcinelo lwawo lonyaka. Mingaphi iminyaka lo mgodi owothi wombe isiqingatha sogcinelo lwawo?

(E) 15

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) $\frac{101}{100}$ (C) $\frac{1}{100}$ (D) 100

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

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

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