

Mathematics Challenge

GRADE 7 FIRST ROUND

SEPTEMBER 2005

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. 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

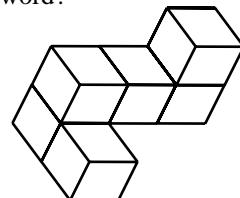
(B) 27

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

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



(C) 26

(D) 25

(E) 24

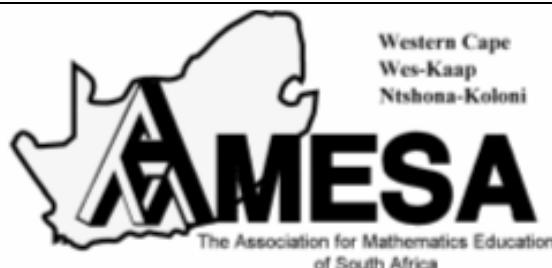
2. 'n Artikel kos R36,15. Hierdie prys sluit Belasting op Toegevoegde Waarde (BTW) van 14% in.
Hoeveel kos die artikel sonder BTW?

(C) R31,72

(D) R31,71

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

(E) R31,07



In cooperation with the
Western Cape Education Department
Gauteng Education Department

Wiskunde-uitdaging

GRAAD 7 EERSTE RONDE

SEPTEMBER 2005

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 2005

QAPHELA:

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

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

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
4. What is the value of a in the table?
 (A) 31 (B) 16 (C) 5 (D) 57 (E) 34
5. The price of an article is increased by 10%. After that the new price is increased by 20%. What percentage is the final price more than the original price?
 (A) 32 (B) 30 (C) 12 (D) 200 (E) None of these
 (F) Nie een hiervan nie
 (G) Ayikho kwezi
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) $p + q + p + q$
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
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) $0,1 \times a$
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?
 4. Wat is die waarde van a in die tabel?

1	2	3	4	...	a
4	6	8	10	...	64

 5. Die prys van 'n artikel word met 10% verhoog. Daarna word die nuwe prys met 20% verhoog. Hoeveel persent is die finale prys meer as die oorspronklike prys?
 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?
 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?
 8. Die antwoord van $n \div 6,34$ is a . Wat is die antwoord van $n \div 634$?
 9. 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?

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

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

(C) 6

(D) 14

9. Mangaphi amanani aphakathi kwe 1 ne 100 athobela le mimiselo ilandelayo?

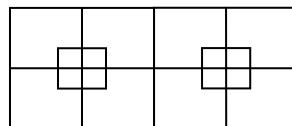
Ukuba lohlulwe ngesi 3 intsalela iba sisi 1
Ukuba lohlulwe ngesi 5 intsalela iba sisi 1
Ukuba lohlulwe ngesi 7 intsalela iba li 0

None of these

(E) Nie een hiervan nie
Ayiko kwezi

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

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



(A) 16

(B) 17

(C) 20

(D) 21

(E) 22

11. The average of seven numbers is 49. If 1 is added to the first number, 2 is added to the second number, 3 is added to the third number and so on up to the seventh number, what is the new average?

(A) 53

(B) 52

(C) 51

(D) 54

(E) 56

12. When a number is multiplied by itself, the result is a *square number*. For example, $3 \times 3 = 9$ and $6 \times 6 = 36$ are square numbers. $12 \times 12 = 144$ is a *3-digit square number* because it has 3 digits. How many 3-digit square numbers are there?

(A) 31

(B) 961

(C) 20

(D) 21

(E) 22

11. Die gemiddelde van sewe getalle is 49. As 1 by die eerste getal getel word, 2 by die tweede getal, 3 by die derde getal, ens. tot by die sewende getal, wat is die nuwe gemiddelde?

11. Umyinge (average) wamanani asixhenxe ngama 49. Ukuba i1 sidityaniswe kwelekuqala inani, isi2sidityaniswe kwelesibini inani, isi3 sidityaniswe kwelesithathu njalonjalo kufikelelwe kwelesixhenxe, Ingaba kengoko umyinge walamanani matsha okugqibela uza kuba ngubani?

12. As 'n getal met homself vermenigvuldig word, is die resultaat 'n volkome vierkant. Byvoorbeeld, $3 \times 3 = 9$ en $6 \times 6 = 36$ is vierkante. $12 \times 12 = 144$ is 'n 3-syfer vierkant want dit het 3 syfers. Hoeveel 3-syfer vierkante is daar?

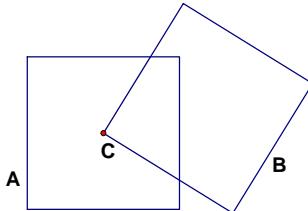
12. Xa inani lithi liphindaphindwe kwangalo isiphumo siba linani ekuthiwa sisikwere. Umzekelo, $3 \times 3 = 9$ kunye ne $6 \times 6 = 36$ ngamanani azizikwere. $12 \times 12 = 144$ linani elinedijiti ezintathu, ingaba kengoko mangaphi amanani azizikwere aneedijiti ezintathu nawo?

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?

(A) 30 cm^2

(B) 32 cm^2

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?



(C) 34 cm^2

(D) 36 cm^2

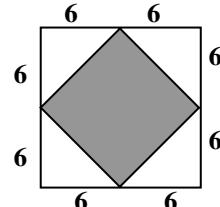
13. Izikwere u A kunye no B ziya fana kwaye zilinganiswa nge 12 cm by 12 cm sisinye. Enye yekona zika B ihleli kwichaphaza elilelona lisembindini ka A. Bungakanani ubukhulu be area eyenziwe mnyama?

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

(A) 62 cm^2

(B) 64 cm^2

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



(C) 72 cm^2

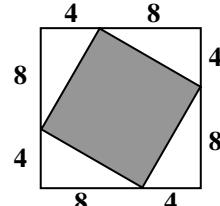
(D) 80 cm^2

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

(A) 62 cm^2

(B) 64 cm^2

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



(C) 72 cm^2

(D) 80 cm^2

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

Not enough information
(E) Nie genoeg inligting nie
Inkcazeloo ayanelanga

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

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

- | | | |
|---|--|---|
| 16. Every year a farmer cuts down all the Port Jackson trees on his farm. He finds that 60% of the trees die, but that the rest grows again from the stumps that remain. What percentage of the original number of trees are still alive after three years? | 16. 'n Boer kap elke jaar al die Port Jacksonbome op sy plaas af. Hy vind dat 60% van die bome doodgaan terwyl die res weer van die stompe af groei. Watter persentasie van die oorspronklike hoeveelheid bome is na drie jaar oor? | 16. Minyaka le umfama ugawula yonke imithi eyi Port Jackson kwifama yakhe. Ufumanise ukuba ama 60% ale mithi iyafa, kodwa intsalela iphindika ikhule kwizikhondo eziseleyo. Ithini ipesenti yenani lokuqala lemithi esaphilayo emva kweminyaka emithathu? |
| (A) 38

17. Twelve teams participated in a netball tournament. Each team played every other team once. How many games were played altogether? | (B) 24

(C) 6,4

17. Twaalf spanne neem deel aan 'n netbaltoernooi. Elke span speel een wedstryd teen elke ander span. Hoeveel wedstryde word altesaam gespeel? | (D) 18

(E) 12

17. Amaqela ayi 12 aye akhuphisana kumdlalo womnyazi (netball). Ngalinye iqela kufuneke lidlale neqela ngalinye kanye. Mingaphi imidlalo etha yadlalwa kulo myadalwa? |
| (A) 24

18. Sipho builds ladders with matches as shown below. How many matches will he need to build a ladder with 15 steps? | (B) 66

(C) 144

18. Sipho bou lere met vuurhoutjies soos hieronder. Hoeveel vuurhoutjies sal hy nodig hê om 'n leer met 15 trappe te bou? | (D) 132

(E) 164

18. U Sipho wakha ii leri ngemicinga njengokuba kubonisiwe ngezantsi. Mingaphi imicinga anokuyisebenzisa ukwakha ileri enamanyathelo ali 15? |
| (A) 47

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? | (B) 45

(C) 44

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? | (D) 50

(E) 49

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

U Jack wayengaphantsi ngelinje kwawaka Peter
U Peter wayengaphantsi ngama 5 kwawaka Melanie
U Peter wayengaphezulu ngama 2 kwawaka April

Ayemangaphi amaqanda ka April? |
| (A) 14

(B) 9

(C) 8

(D) 10 | (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? | 20. Larry koop altesaam 32 appels en lemoene vir R52. 'n Appel kos R2 en 'n lemoen kos R1. Hoeveel appels het hy gekoop? | 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? |
| (A) 12 | (B) 16 | (C) 20 |
| (D) 22 | (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 $5^{14} \div 5^{17}$? | 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 $5^{14} \div 5^{17}$? | 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 $5^{14} \div 5^{17}$? |
| (A) $\frac{1}{25}$ | (B) $\frac{1}{125}$ | (C) $\frac{1}{15}$ |
| (D) 25 | (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^{2005} end? | 22. $3^4 = 3 \times 3 \times 3 \times 3 = 81$, dus eindig 3^4 op 'n 1.
Op watter syfer eindig 3^{2005} ? | 22. $3^4 = 3 \times 3 \times 3 \times 3 = 81$, ngoko ke u- 3^4 uphela ngo-1.
Ingaba u- 3^{2005} yena uphela ngeliphi inani? |
| (A) 1 | (B) 3 | (C) 4 |
| (D) 7 | (E) 9 | |
| 23. If the pattern below is continued, find the 10th fraction in this sequence: | 23. As die patroon hieronder voortgesit word, vind die 10de breuk in die ry: | 23. Ukuba olu luhlu lungezantsi luyalandelwa, luyakubeli lingubani iqhezu elihleli kwindawo ye 10? |
| $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \dots$ | $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \dots$ | $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \dots$ |
| (A) $\frac{1}{60}$ | (B) $\frac{1}{90}$ | (C) $\frac{1}{100}$ |
| (D) $\frac{1}{110}$ | (E) $\frac{1}{80}$ | |
| 24. In question 23, find the sum of these 10 fractions. | 24. In vraag 23, vind die som van hierdie 10 breuke. | 24. Kumbuzo 23, bala isiphumo sokudityaniswa kwamaqhezu ali 10. |
| (A) $\frac{10}{11}$ | (B) $\frac{9}{10}$ | (C) $\frac{109}{110}$ |
| (D) $\frac{29}{30}$ | (E) $\frac{53}{60}$ | |
| 25. Study the pattern shown below. What is the product of the numbers? | 25. Bestudeer die patroon hieronder. Wat is die produk van die getalle? | 25. Funda olu luhlu lubonisiwego ngezantsi. Sithini isiphumo sokuphindaphindwa kwala manani? |
| $(1+1) \times (1+\frac{1}{2}) \times (1+\frac{1}{3}) \times (1+\frac{1}{4}) \times (1+\frac{1}{5}) \times \dots \times (1+\frac{1}{100})$ | $(1+1) \times (1+\frac{1}{2}) \times (1+\frac{1}{3}) \times (1+\frac{1}{4}) \times (1+\frac{1}{5}) \times \dots \times (1+\frac{1}{100})$ | $(1+1) \times (1+\frac{1}{2}) \times (1+\frac{1}{3}) \times (1+\frac{1}{4}) \times (1+\frac{1}{5}) \times \dots \times (1+\frac{1}{100})$ |
| (A) $\frac{99}{100}$ | (B) $\frac{101}{100}$ | (C) $\frac{1}{100}$ |
| (D) 100 | (E) 101 | |